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Contents

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Editorial

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formal[illegible]prmc[illegible]pal[illegible]role[illegible]of[illegible]RFA[illegible]Argus[illegible]such[illegible]collaborat[illegible]on[illegible]can[illegible]do[illegible]no[illegible]harm[illegible].

Few would argue against Rickard and his colleagues' statement that ethical committee scrutiny of their protocol involving defrosted chicken vascular bundles was not required. It is a statement of the blindingly obvious but raises the question – when is ethical scrutiny of a research protocol required? Robert Linton as Chair of the MOD Research Ethics Committee (General) sheds much needed light on this topic and provides insight and guidance to the process of gaining ethical approval. His paper will be of practical benefit to anyone, whatever their background or professional area of practice, who undertakes research or project involves uniformed personnel as subjects.

Bridger, whose work and that of others did involve uniformed subjects as responders to questionnaires, provides a timely overview of occupational stress in the Naval Service, setting out the origins and background to this important research and giving an overview of recent findings.

I suspect few of us will consider the function and structure of hospitals in quite the same light again after reading Peter Buxton's fascinating analysis of the Royal Hospital Haslar over the past 250 years or so. I am grateful to him for taking the time and effort to adapt his prize winning dissertation for our readership. One can only wonder at the quality of the original design of the hospital and its ability, with little help, to adapt successfully to such markedly different threats and requirements with so little, if any, structural change to its structure. His unusual and unfamiliar perspective adds another dimension to our knowledge and compliments existing texts on the history of the hospital. I hope that this is only the start of Peter's published detective work on this remarkable site.

The historic theme is complimented by Eric Burbeck as he continues his personal recollections of life in the Andrew as a medical branch rating, one of which was spent at Haslar. While his reminiscences are light hearted and amusing, often recalling characters who will be known to a significant proportion of our older subscribers (and even more sometimes) few will know of the more serious work that Eric and others are doing to preserve the rather more tangible artefacts of his Branch and Haslar Hospital for future generations.

I am also grateful to Captain David Wright for his memories of 1982 and a Headquarters view of Operation Corporate. As a general rule in reporting on military operations we tend to focus our attention on doctrine medical organisation casualty figures and clinical detail overlooking the important but essentially bureaucratic content but often made at much higher levels. As the better part of a third of the Royal Naval Medical Service prepares to mobilise in support of Operation Herrick I am sure today's reporter and drafter will consider that David Wright had an easy task by comparison with theirs and that we are considerably better prepared than was the case in 1982. Wright's recollections also indirectly highlight the pitfalls of not having medical staff placed centrally within the highest levels of the naval organisation a subject commented on by Surgeon Vice Admiral Sir Sheldon Dudley FRS (1884-1956) a former Medical Director General of the Navy in his Bicentennial Lond Lecture (1). Fortunately our present organisation places the medical family firmly in the core of Fleet Headquarters but not quite at Navy Board level as advocated by Dudley. His arguments for this level of representation and observations on the value of hospital ships and naval health issues in general make interesting reading 50 years or so later while also having a remarkable relevance which we would do well to heed today.

Reference

1 Dudley SF James Lond Laudatory Address. *Proceedings of the Nutrition Society* 12(3): 202-209 1953

Clinical

Molecular weight of Hydroxyethyl Starch Molecules influences Coagulation Profile measured by thrombelastography

M Felfernig, S Virmani, M Weintraud, U Oberndorfer, M Zimpfer, H Veen, A M Blaicher

Summary

Background The consensus about the ideal intravenous fluid in trauma patients remains open. However, hypertonic saline and hydroxyethyl starch (HES) seems to have advantages in terms of immuno-modulatory and haemodynamic effects. Nevertheless clotting abnormalities are frequently reported in association with the use of HES. We investigated the influence of light, medium and heavy molecular weight (MW) hydroxyethyl starch (HES) on coagulation in 28 healthy subjects.

Methods Ringer's lactate (RL) served as a control solution. Thrombelastography using Haemoscope's Thrombelastograph® (TEG®) hemostasis system was used to assess the effect of HES polymers and RL. TEG analysis was performed using recalcified native whole blood both with and without the addition of platelet activating factor IV (PAF IV) before and immediately after infusion of one of the solutions.

Results Infusion of RL or one of the three HES solutions exerts an anticoagulant effect as demonstrated by a increase in clot formation time (R) and a decrease in maximum amplitude (MA) and the angle. The addition of PAF IV reversed these changes.

Conclusions This data indicate clear evidence of platelet activity per se or platelet interaction with the plasmatic coagulation system.

Key words Coagulation, thrombelastography, platelets, hydroxyethyl starch

Introduction

Hydroxyethyl starch (HES) is a synthetic colloidal glycogen like polysaccharide available in different molecular weights (MW)[1,2]. The use of HES in Trauma and Intensive Care medicine is still controversial [2,5]. It has been reported to exert adverse effects on haemostasis [6,7], which may in turn aggravate coagulopathies in the perioperative period. Nevertheless its use as standard volume in war surgery might be very useful and is discussed.

Previous studies investigating the effects of HES on hemostasis reveal conflicting results [2,4,11]. This controversy could be due to the lack of comprehensive studies on the used HES solutions. Until now only one investigation has evaluated the effects of various colloidal solutions including HES with 200 kDa and 450 kDa on platelet aggregation in vivo [11]. 840 ± 90 mL of high MW HES and 950 ± 100 mL of low MW HES were administered to patients undergoing cardiopulmonary bypass. There was a significant reduction of platelet aggregation in vivo in both of the HES groups. Platelet function was assessed by aggregometry using the turbidometric technique (inductors: ADP, epinephrine, collagen).

Jamnicki et al found no difference in progressive haemodilution with either HES 130 kDa or HES 200 kDa on the TEG waveform in vitro [11]. The Thrombelastograph® (TEG®)

their [illegible] [illegible] [illegible] [illegible] linkage [illegible] [illegible] ...tion of platelets with [illegible] plasmatic coagulation cascade [illegible] to other coagulation tests the TE[G] also assess hypercoagulability. Furthermore the TEG has also been shown to detect hypo coagulability with a decrease in platelet function following in vitro dilution of whole blood with 0.9% saline [12,13].

We studied the influence of HES with increasing molecular weights on whole blood coagulation assessed by the TEG. PAF IV was used to induce platelet activation in order to prove the hypothesis that HES interacts with coagulation factors and platelet surface receptors.

[illegible] prospective randomized trial we used TEG analysis to investigate [illegible] whole blood [illegible] and without the addition of PAF IV [illegible] patients before and after a [infusion] of [illegible] one of the various molecular weights of HES.

Patients and methods

Informed consent was obtained from 29 consecutive patients (18 male, 12 female, age [illegible] – 79 years, ASA I) scheduled for elective [knee] arthroscopy within a two month period. Exclusion criteria were: a) past or present bleeding or thrombosis, b) abnormal preoperative screening tests (red blood cell count, platelet count, prothrombin time, activated partial thromboplastin time and TEG), c) [medication] two weeks prior to surgery and d) [body mass] index (weight (kg)/height (cm) × 100) [illegible] 0.8 or > 1.2.

Patients were randomly assigned to one of [three groups] [infusion] of 500 ml of one of three HES [solutions] or a control group:

- HES [70] MW 70 kDa / S 0.5 [illegible] Expafusin Pharmacia & Upjohn [illegible] Austria)
- HES 200 HES MW 200 kDa / S 0.66 (HAES [steril] 6% Leopold Pharma Graz, Austria)
- HES 450 HES MW 450 kDa / S 0.66 (Plasmasteril 6%, Leopold Pharma Graz, Austria) or
- [a] control of 1000 ml Lactated Ringer's (RLs). Table 1 lists the electrolyte concentrations of these solutions.

The colloidal and crystalloid solutions were given over a period of 30 minutes prior to any intervention. Blood samples were obtained via antecubital vein puncture pre and post infusion of one of the respective fluids without any other intervention. 4.5 ml samples of whole blood were collected in silicone-coated glass tubes containing 0.5 ml of 0.129 M buffered sodium citrate (VACUTAINER System® Becton Dickinson, Meylan Cedex, France). After blood sampling TEG measurements (CTEG #3000 Haemoscope Corporation, Niles, IL, USA) were performed simultaneously: I without activation (NATIVE) and II with activation using 90 mg platelet activating factor 4 (PAF IV) (Haemoscope Corporation, Niles, IL, USA). We recalcified 300 µl citrated whole blood with 60 µl of 0.645% CaCl2 to start the TEG test. All measurements were performed within 30 minutes after collection of blood samples.

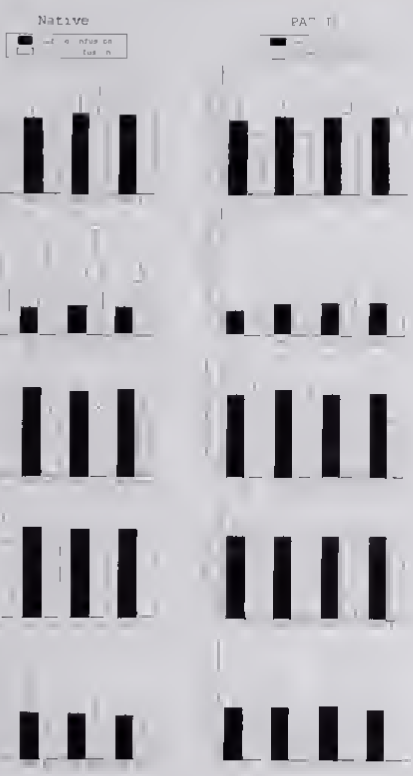
The TEG waveform can be divided into various sections: the reaction time (R) reflecting the function of the coagulation factors, the coagulation time (K), which is influenced by the activity of coagulation factors, fibrinogen and platelets, the maximum amplitude (MA) of the TEG tracing which reflects clot strength as a function of platelets and fibrinogen, the angle (α), which is identified by the tangent line from the split point (R parameter) to the curve of the TEG waveform and the clot lysis index (LY60) which is the percentage reduction of the area under the curve 60 minutes after achieving MA (Fig 1).

Statistical analysis

After testing for normal data distribution the Student's t test for paired samples was performed. $P < 0.05$ was considered statistically significant. The data are reported as means ± standard deviation.

Results

29 consecutive patients within a two month period were randomly assigned to receive


Native

	RL	HES 40	HES 200	HES 450
	9.861	5 806	5 873	5 819
	142	159	163	157
	3.8	4	4 0	4 0
	155	155	160	154
	2 79	1 33	1 24	1 28
	309	309	326	363
		26 4	34.6	36 5
		40	200	450
		0 6	0 6-0 7	0 6-0 7

Table 1 Values of the infused solutions

[illegible] FL 7 HES 40 (n=6) HES 200 [illegible] HES 450 (n=6) Due to technical problems four patients were excluded Demographic data and preoperative screening tests indicated that the groups were similar (Table 1) TEG baseline measurements were distributed normally in the native (NATIVE) and the PAF IV activated samples

Comparison of NATIVE and PAF IV activated TEG findings pre and post infusion revealed significant differences in several aspects (Fig 1)

Reaction time (R) A significant increase was seen only with HES 40 in NATIVE

Clot formation time (k) This was significantly increased in NATIVE with all the solutions Addition of PAF IV reversed this increase

Maximum Amplitude (MA) MA was significantly decreased with all the solutions in NATIVE These decreases were reversed by addition of PAF IV to RL HES 40 and HES 200 However the MA effects of HES 450 HES was not altered by adding PAF IV

Angle (alpha fa) RL HES 200 and HES 450 decreased in NATIVE this effect was reversed by the addition of PAF IV

Clot lysis index (LY60) No effects were seen in the LY60 except for HES 450 which significantly decreased the LY60 only in NATIVE

Table 2 summarizes the changes of routine laboratory parameters before and after infusion of the respective solutions

Discussion

Our investigation studied the influence of RL HES 40 HES 200 and HES 450 on coagulation parameters and the TEG in a prospective randomized controlled trial in vivo We have chosen this way because in vitro studies address this topic only on an experimental level The results suggest that infusion of RL or any of the three HES solutions exerts an anticoagulant effect as demonstrated by a decrease in clot formation time MA and a The fact that the addition of PAF IV reversed most of these changes indicates that there is either an inhibition of platelet activity per se or an interaction of platelets with the plasmatic coagulation system

HES molecules with a wide range of molecular weight and degree of substitution have been shown to be effective as acute volume expanders [2 5 6] It has been suggested that the effect of HES on blood coagulation increases with increasing

	RL		HES 40		HES 200		HES 450	
	pre infusion	post infusion	pre infusion	post infusion	pre infusion	post infusion	pre infusion	post infusion
red blood cell count (T/L)	4 31 ±0.24	4 04 ±0.22	4 31 ±0.38	3.80 ±0.40	4 71 ±0.33	4 1 ±0.35	4 78 ±0 31	3 81 ±0 37
white blood cell count (T/L)	8 76 93	1 88 1 87	8,86 ±1.88	9 74 ±2.54	9 53 ±4 7	10 26 ±3 20	9 35 ±2.85	6 09 ±2 06
haemoglobin (g/dL)	3 31 ±0 57	±2.88 ±0 87	13 71 ±1.21	12 34 ± 33	14 53 ±0 93	12,47 ± 26	2 78 ±1 08	±1 54 ±1 14
haematocrit (%)	38.23 ±2 75	36 78 ±2 81	38,38 ±3,72	35,41 ±3.70	41 83 ±2.95	37 06 3,49	37 88 3 1	33,56 3 16
platelets (10 µL)	201 11 ±41 20	200 40 ±41 81	215 14 ±14,56	208 86 ±65 13	256 86 ±23 47	225 43 ±19 78	23 13 ±42 58	202 43 ±39 62

Table 2 Changes in red blood cell count white blood cell count, haemoglobin haematocrit and platelets before and after infusion of different solutions in means ± standard deviation

molecular weight [14 18] an increasing degree of substitution [17] and increasing the C2/C6 ratio [17] Chen et al recently reported that HES200/0 5 and HES130/0 4 both can inhibit platelet coagulation They detected that platelet dysfunction recovered faster after the infusion of HES130/0 4 than after HES200/0 5 [19] In our study we used HES of different molecular weights with almost the same C2/C6 ratio and the same substitution rate of 0 6-0 7 to compare the isolated influence of molecular weight on coagulation tendency and platelet function

We were unable to detect any significant difference in the effect of various molecular weights of HES solutions on blood viscosity in vivo when tested without any activator However this conflicts with other publications [12 13] possibly because we used patients without any prior intervention Despite this we were able to show a similar clinical relevant haemodilution in the different solution groups with respect to the TEG MA (Fig 1) and platelet and erythrocyte count (Table 2)

HES has a specific effect of lowering factor VIII C and von Willebrand factor concentrations but does not have any influence on the activity of the fibrinolytic system using molecular weights of 200 kDa and 450 kDa [17] A calculated rate of approximately 40% haemodilution with 6% HES solutions caused significant changes in the TEG tracings MA was decreased and k increased Our working group was recently able to detect a significant prolonged in vitro bleeding time and significantly decreased expression of GPIIb/IIIa on ADP activated platelets after 40% haemodilution using whole blood flow cytometry However the expression of P selectin was not influenced [20]

Platelets provide a phospholipid surface for coagulation reactions in the standard TEG tracing and thus promote the formation of fibrin [21] platelets bind to fibrinogen and modulate the viscoelastic properties of the clot via the specific platelet surface glycoprotein IIb/IIIa [22] About 80% of the MA of the TEG is dependent on the GPIIb/IIIa receptor [20 22] A decreased expression of this receptor [illegible] has been observed The [illegible] explained by a [illegible] cytoplasmic [illegible] proliferation [illegible] elastic shear [illegible] [22 24] Free [illegible] availability of fibrinogen [illegible] platelet surface [illegible] infusion Dauschies [illegible] macromolecule [illegible] platelets The [illegible] ligands to the platelet fibrinogen receptor [25 26] PAF IV [illegible] platelet aggregation via an associated formation of the second messengers inositol 1 4 5 triphosphate (IP3) and 1 2 diacylglycerol (DAG) produced by hydrolysis of the membrane phospholipid phosphatidylinositol 4 5 bisphosphate IP3 releases Ca2+ from intracellular stores and DAG activates protein kinase C These two messengers interact synergistically to induce platelet shape change aggregation and secretion [27] Platelet count and fibrinogen level are underlying factors of the TEG MA and do not significantly differ following infusion of any solution in any group In contrast the influence of RL and HES 40 on the TEG waveform is reversed when PAF IV is used in vitro This reversal is not significant when HES 200 or HES 450 is used The reported mild increase in postoperative FVIII RAct and FVIII RC [22] and the reversal of the decrease in the TEG MA further emphasize that HES does not interact with platelet aggregation [8] Thus mild dilutional thrombocytopenia and impairment of platelet adhesion [28] Fibrin is able to cross link over a distance of 1 mm HES 40 HES 200 and HES 450 have increasing molecular sizes In order to the decreased possibility of fibrin cross linkage is directly proportional to the linear distance between platelets due to small molecular weight and therefore we hypothesize a direct proportional correlation between decrease of coagulability and increase in molecular weight of HES

There is not as yet a clear guideline for appropriate daily routine use of a [illegible]

References

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Clinical

Fowl Surgery at Sea. Proving a microvascular capability in PCRF

J J Smith, G V Scerri, R F Rickard

RFA Argus Exercise Medical Endeavour 2006

Key words RFA Argus PCRF Microsurgery Exercise

Introduction

Whilst a well rehabilitated amputee is the functional yardstick by which lower limb salvage should be measured the resurrection of a comprehensive plastic surgery service within the armed forces should lead to a greater number of well selected cases where limbs are saved. Civilian experience and training mandates a combined plastic/orthopaedic surgery approach to the management of these injuries and definitive reconstruction within five days (1). Some trauma centres advocate much earlier definitive treatment (2). Experience from the Falklands during the Croatian and Bosnian Wars provides good evidence that these civilian treatment paradigms translate directly to patients of much higher energy trauma experienced during warfighting (3, 4). Early reconstruction in this situation significantly improves outcomes in terms of fewer infections, reduced time to bony union, shorter hospital stay and fewer complications.

Reconstructive choices depend on vulnerable factors and often the most expedient surgical solution is neither the most time nor cost effective nor the most durable. In addition where fractured ends displaced bone is denuded of periosteum any reconstruction must be sow vascularized tissue to permit fracture healing and reduce chances of chronic infection whilst also providing wound closure. Anatomically local flap options may not be available due to the position of the tissue defect or the effects of higher energy trauma. Therefore a reconstructive service must be able to provide microvascular capability to allow the autotransplantation of composite tissues, most likely free vascularized muscle and skin deflaps.

A separate aeromedical issue of major demand on any facility with a covered helicopter capability is the repatriation or revascularization of limbs or parts of limbs where the mangled injury pattern allows. Any structure that contains muscle including a hand amputated at or above the wrist must be replanted within 6 hours of cold ischaemia time. Digits will tolerate a longer period of cold ischaemia but most would advocate that these should be revascularized within 18 hours of injury.

The Royal Navy's Primary Casualty Receiving Facility (PCRF) has been described by a previous Deputy Chief of Defence Staff (Healthcare) probably the finest role three facility anywhere [Telic One] (5). Not simply a field hospital in the bowels of a ship, PCRF provides unique opportunities for casualty care as well as certain distinctive limitations. A germane example of the former is that heavy but delicate equipment such as an operating microscope may be kept securely on board for use at short notice an advantage that does not hold true for a tented field hospital. However any downstream blockage in the medical logistics pipeline (e.g. poor weather preventing deck operations or an unfavourable political or diplomatic environment which prevents timely onward casualty movement may lead to definitive reconstruction proving clinically necessary on board. This may be

...ally true for local security forces or ... y personers of war
... RFA ... now RFA ARGUS primary role ... facility is exercised annually. Trained ... sonnel are in place to provide a microvascular capability and any existing material deficiencies are relatively minor. What has not been tested is whether surgery requiring this level of dexterity can be carried out on a moving platform. This was investigated during Exercise Medical Endeavour 2006 by the use of inexpensive and locally available resources.

Materials and Methods

A 1.6 Kg (3.5 lb) frozen chicken was sourced from the ship's galley and allowed to thaw. Using a lightweight head mounted microscope (VarroScope® M5 (Life Optics GmbH, Vienna, Austria)) then undergoing a trial on board, the skin and fat were dissected away to reveal the neurovascular bundles of the legs and wings (Figure 1). Five to eight centimetre lengths of one-to-two millimetre diameter vessels were harvested. In the absence of any formaldehyde or brandy on board, these vessels were stored in Pusser's® Rum (Pusser's West Indies Ltd, Tortola, British Virgin Islands) and kept in a refrigerator for five days until the exercise temporarily provided a suitable opportunity for the assessment (Figure 2).

On St Patrick's Day 2006 an exercise casualty, expertly simulating a traumatic guillotine-type foundation amputation from his dominant hand, provided an ideal opportunity to prove the capability (Figure 3). Because of the relatively lengthy nature of this type of surgery, Command approval was sought and during the middle and morning watches of 18 March the capability was tested. During the period of assessment, RFA Argus was operating in the western Mediterranean Sea south east of Gibraltar. Through PCRF Command a request was passed to the ship's Captain to maintain a course and speed that caused least pitch and roll and to warn the theatre staff of any planned changes of course. Roll was recorded overnight by the Officer of the Watch from the bridge inclinometer.

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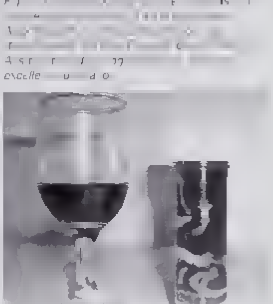

Figure 2. Neurovascular bundles were pre... in Pusser's® Rum and rehydrated for five days prior to removal and rehydration in water.

Prior to anastomoses being undertaken the vessels were removed from the rum and rehydrated in water. Rum stained peri-adventitial tissues were dissected off using a VarroScope®. The vessels were secured between two 23G needles on a brightly contrasting background material. The single operator Leica M841 (Leica Microsystems GmbH, Wetzlar, Germany) deck mounted microscope presently held onboard was used. Microsurgical instruments and sutures, not presently part of the PCRF Medical Equipment

Figure 1. [illegible] casualty [illegible] guillotine [illegible] of [illegible] his dominant hand.

Table for Service [illegible] (METSA) [illegible] brought onboard [illegible] theatre [illegible].

Results

The exercise was carried out between 00[illegible] and 0610. Two surgeons took part [illegible] the assessment. [illegible] & RFA [illegible] duty in the theatre [illegible]. Sea [illegible] throughout [illegible] seven degrees. [illegible] degrees of roll [illegible] microscope [illegible]. Beyond this [illegible] proved necessary [illegible] the [illegible] ship's [illegible] permitted too [illegible] movement [illegible] of the ship. [illegible] ship's [illegible] hamper the [illegible]. The microscope [illegible] not move. [illegible] the [illegible] full [illegible] microscope, and focus had to [illegible] by [illegible] the operating table. The single operating [illegible] did not permit direct surgical assistance.

Neither surgeon, one a naval officer with many sea miles under his keel and one an air force officer recovering from a severe bout of seasickness, found the ship's movement a distraction.

Measured digitally (Carnoy v2.1, Biovolution, Leuven, Belgium, http://www.biovolution.org), vessels ranged from 0.58 to 1.96mm in external diameter. Twelve consecutive microanastomoses were carried out on these vessels using 9/0 USP and 10/0 USP Ethilon® (Ethicon, Johnson & Johnson Medical Limited, Edinburgh, UK). Each surgeon carried out six anastomoses. Two were performed using continuous suture technique, and the remainder by interrupted suture technique (Figure 4). Patency was demonstrated in all anastomoses by flushing and by microscopic inspection.

Discussion

Microvascular training in the United Kingdom is conducted in a very few centres, each specifically designated under the Animals (Scientific Procedures) Act 1986. These centres use terminally-anaesthetised strain specific rats supplied from designated breeding establishments. The use of wild-caught species, such as the bilge rat, is specifically prohibited under Section 10(3)(d) of the Act except where an exemption is granted by the Secretary of State for the Home Department (6). As part of the application for a place on a microsurgery course, trainees are granted a limited and short term licence from the Home Office to allow them to perform this training on

Figure 3. Femoral artery of a chicken. Twelve anas[illegible] 0.58[illegible] to 1.96 mm.

a live animal. Instructors hold a relevant Personal Licence for five years.

No model can match microvascular surgery in humans better than that provided by pulsatile flowing blood in living vessels. However, for the purposes of proving a microvascular capability in PCRF, it was thought unnecessary and unethical to use live animals. Other models are available. Silastic tubes can be used for dexterity training of novice surgeons, but lack realism in texture and handling, even in large vessels (7). Cadaveric vessels are the next best option; their harvest and use is unregulated, and early dexterity training is often provided by their use on microsurgery courses. The use of fresh chicken vessels has been described previously (8, 9), and their use in revalidation and interview has been more recently advised from a respected civilian microsurgery centre (10). Unlike Sucur et al. (8), who advocated only fresh chicken vessels, we found that thawed frozen chicken vessels were perfectly adequate after chilled preservation in Pusser's Rum for five days, followed by rehydration in water. Unlike these authors, we cannot comment on the differences between battery fed and free range animals' vessels.

With tongue removed from cheek, some more serious points arise from this assessment. ARGUS, other than secondary role as an aviation training platform, and as such the ship's officers are used to adjusting the ship's heading to influence the effect of wave motion on the ship and to optimise deck conditions for flying. This expertise was brought to bear during the assessment, and a stable platform with minimal pitch and roll was maintained. The operating theatres are low down in the ship, and any movement that was experienced did not influence the ability to perform a technically sound microanastomosis even down to an external vessel diameter of 0.58mm. An evaluation of the likely impact of greater movement would need to be made at the time.

The assessment also emphasised the interdependence of, and the need for communication between, the ship's officers and the PCRF and helped to dispel any

potent [illegible] be [illegible]

The [illegible] to [illegible] [illegible] operat[illegible] short [illegible] on in PC[illegible] present [illegible] regarded [illegible] priority by [illegible] surgery. Oph[illegible] ENT. A se[illegible] vascular surg[illegible] instruments [illegible] stock of sur[illegible] microvasc[illegible] and an 8MHz unidirectional Doppler probe to [illegible] planning and [illegible] to be added to the ME[illegible] requested through the [illegible] Requirement p[illegible]

PCRF m[illegible] single Plastic Surg[illegible] CPFSF [illegible] is felt to be inadequate [illegible] trauma in a [illegible] workload during [illegible] is supported by Orthop[illegible] General Surgery [illegible]

The oth[illegible] whether or not this typ[illegible] performed [illegible] tempo[illegible] These procedures [illegible] through the perception [illegible] Should one need [illegible] because of the min[illegible] there are [illegible] world produce [illegible] flaps could be [illegible] and [illegible] secondary [illegible] allowed. [illegible] not yet [illegible] bridge to [illegible] contra[illegible] would [illegible] thinking may [illegible] perceived difficulties [illegible] high standard of [illegible]

One question [illegible] answered is the onward movement of a casualty who has undergone such [illegible] would be necessary to keep [illegible] HDU or ITU setting for a [illegible] surgery. This might include [illegible] of altitude on such a [illegible] and its potential subje[illegible].

There are [illegible] factors that may contribute to the [illegible] failure of an autologous [illegible] and [illegible] flap. With [illegible] environment on PCRF [illegible] critical.

Conclusion

A microvascular capability on board PCRF has been proven. Whilst [illegible] provided a degree of amusement, the chicken and its vessels proved to be an effective and economic method for exercising this capability. Relevant personnel deficiencies and equipment gaps between the present METSA and the minimum standard necessary to provide this reconstructive capability on board PCRF are being addressed.

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Clinical

Diagnostic Peritoneal Lavage versus Hand-Held FAST: The Future for Diagnosis of Injury in the Military Environment

M A Khan, R E Lovegrove

Introduction

Ultrasonography has proven itself to be an indispensable modern day modality in assessing the status of the injured patient. It serves as an adjunct to clinical examination and allows visualisation of the internal organs of the chest and abdomen as well as allowing the assessment of the presence of free fluid. Initially ultrasound devices were only available as large cumbersome machines that were difficult to take to the patient and required a mains power supply at all times. Recent technological advances have led to the development of hand-held portable devices which can run from batteries and weigh no more than 2.4 Kg (1).

Diagnostic peritoneal lavage (DPL) by comparison has been a tried and tested aid for a number of decades and was first described by Root et al in 1965 (2). It is an invasive procedure requiring a small abdominal incision to be made through which an irrigation catheter can be passed. It has an accuracy of between 98% and 100% depending on the criteria used (3). However meticulous surgical technique is required as the time of gaining peritoneal access since excessive bleeding will potentially lead to a false positive result.

The purpose of this article is to evaluate the pros and cons of each diagnostic tool and demonstrate whether one may be preferable in the military environment. A literature review of all articles in which hand held focused assessment with sonography for trauma (HHFAST) was performed underwent analysis to determine whether HHFAST was comparable if not better than DPL.

Analysis

The first major difference established between HHFAST scanning and DPL is HHFAST is not limited by anatomical boundaries. DPL can only be used to diagnose intraperitoneal injuries whereas HHFAST scanning can be used on all body cavities thorax peritoneal cavity retroperitoneum and pelvic cavity. HHFAST therefore has an extended role over DPL in the assessment of a trauma patient.

In order to undertake DPL (initially) a urinary and a nasogastric catheter are required to be inserted. The insertion of these may be contraindicated in the presence of pelvic fractures with a high riding prostate or in blast injuries where there may be oesophageal disruption. Using a sterile technique an open or a closed (Seldinger) approach is used to breach the peritoneal cavity in the midline. A catheter is then introduced and 1000ml of warm Hartmanns solution is infused into the abdominal cavity via the catheter. Once the bag has run through it is placed on the floor where under the influence of gravity the fluid is recollected back into the original bag. A minimum of 200ml is required to adequately sample the abdomen (4).

A positive result is deemed to occur if >10ml of frank blood is drained or gastric contents are aspirated. The presence of bile/vegetable fibres in a haemodynamically unstable patient warrants a laparotomy. The collected fluid is sent for analysis in the laboratory to check for blood cells and bacteria.

Individuals who sustain penetrating gunshot wounds to the abdomen routinely have

[illegible]

significant difference co[illegible] examination. It was show[illegible]vity [illegible] 8% specificity of [illegible] and NPV of 97% (8).

[illegible] assessing bl[illegible] prospective study o[illegible] 313 pa[illegible] de[illegible]ated HHFAST examination [illegible] sensitivity of 77%, specificity of 99% [illegible] PPV of 96% and NPV of 94% for the [illegible] of free fluid in the peritoneal cavity and 64%, 99%, 96% and 89% respectively for documented injuries. It concluded that HHFAST detects intraperitoneal fluid with high degrees of accuracy. It will miss some injuries but the majority of injuries [illegible]ssed do not require therapy (1).

Conclusion

Both diagnostic tools have demonstrated that they are effective in detecting injuries to [illegible]ernal organs. However HHFAST in the limited timeframe it has been available has demonstrated that it has become an [illegible] tool in the management of [illegible]viduals in the emergency setting and is [illegible] widely taught to individuals involved [illegible] emergency management of patients [illegible] military environment. HHFAST is [illegible] transport as no additional equipment [illegible] to diagnosis. It can also be used [illegible] monitoring as well as diagnosis of [illegible] results. The one drawback it [illegible] DPL is that it demonstrates user [illegible]. Best results are obtained from [illegible] experienced personnel [illegible] HHFAST has demonstrated that it has

Table 1 [illegible]

Hand Held FAST	Diagnostic Peritoneal Lavage
Relatively quick	Time co[illegible]
Non invasive	Invasive + ass[illegible] complications
Thorax/Peritoneal/Re[illegible] Pelvic cavities	Peritoneal [illegible]
[illegible] dependent	Minimal [illegible] dependency
[illegible]	Re[illegible] to lab analysis to full results
[illegible]	Dia[illegible] y
[illegible]	H[illegible]
[illegible]	H[illegible]

Table 2 Se

Author						
K Kpatrick et al					74%	
K kpatrick et al						
K patrick et al					78%	
B [illegible]					100 %	
G [illegible]						
S [illegible]						
[illegible]						
Sc [illegible]						

potential [illegible]
available replace [illegible]

References

1 Kirkpatrick AW [illegible]
Prospective eva [illegible]
abdominal sonog [illegible]
abdominal trauma [illegible]

2 Root HD Hauser CA [illegible]
Diagnostic Peritoneal [illegible]
57 633 7

Sato T Hosoe S [illegible]
peritoneal lavage [illegible]
several nurs [illegible]
clinical [illegible]
35 11 935 9

4 Nagy KK Roberts FL [illegible]
Experience [illegible]
injuries [illegible]

5 Tolen [illegible]
Evaluation [illegible]
stab patients [illegible]
abdominal trauma [illegible]

6 [illegible] M Lee C H P F [illegible]
computerized [illegible]
Computed [illegible]
ultrasonography [illegible]
abdominal [illegible]

Surgeon [illegible]
General Hospital [illegible]

Richard E Lumley [illegible]
College Road

General

Naval Service Cohort Study of Occupational Stress: Background to the research and a review of the latest findings

R S Bridger

Abstract
The Naval Service has been actively involved in research on occupational stress for almost 10 years. Three cross-sectional studies have been completed during this time period. It has been shown that the prevalence rate of psychological strain amongst personnel is relatively constant at 31-34%. Several smaller studies of personnel at sea and of the availability of support services have also been completed. In general, the research has shown that the prevalence rate of strain is higher in the RN than in the general population and is comparable to that found in similar uniformed service organisations such as the Police.

Recognising the limitations of cross-sectional research methods, the decision was made in 2006 to follow a cohort of personnel over a 6 year period in order to gain better understanding of the processes by which work demands impact on psychological health and to determine whether psychological ill health has an adverse impact on factors such as premature voluntary retirement and medical downgrading.

The paper presents the history of the research and some of the work in progress.

Disease is a pathological process that at least in theory is amenable to objective external verification. Illness on the other hand is by definition a subjective state. D Coggan 2006[1]

Introduction

Psychological strain is not randomly distributed across people or over time. It is systematically linked to the demands placed upon people by their jobs, by their families, by the environment in which they live and by themselves. Figure 1 presents a general model of strain from an organisational perspective. Job demands (hereafter occupational stress) combine with all other demands placed on the individual and when the imposed stress exceeds the capacity to cope, psychological strain is the result.

Psychological strain manifests itself as anxiety and depression at a psychological level and common symptoms are disturbed sleep, lowered mood, inability to concentrate, feelings of unhappiness and low self worth.

There are many good reasons for organisations such as the Naval Service to take a healthy interest in occupational stress and its effects on personnel. The most obvious being to determine whether the demands the organisation places upon its personnel are excessive. In other words, whether personnel are able to cope with work demands. If personnel are unable to cope, they will exhibit signs of strain and it will be possible to identify those work demands that are associated with strain and those that are not.

Chronic strain is thought to be associated with ill health in those who suffer it, and may result in long term medical downgrading, medical boarding, PVR (premature voluntary retirement) and other adverse outcomes as described below.

There are secondary reasons for taking an interest in occupational stress. The Health and Safety Executive (HSE) has recently published a set of stress management standards and although these do not have the force of

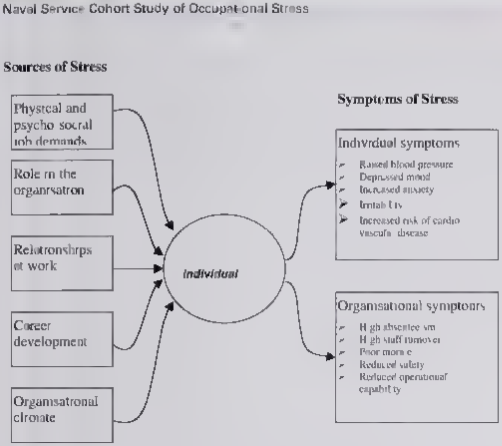

Figure 1 Person-centred model of occupational stress When work demands exceed the capacity of the individual a characteristic stress response results This response manifests itself as anxiety and depression at the psychological level Chronic exposure to excessive demands can cause cardiovascular and metabolic problems (11)

legislation organisations will come under increasing pressure to take action and carry out stress audits using the HSE stress management tool The HSE approach is of interest because in the tradition of occupational hygiene it focuses on the identification and management of occupational exposures thought to be harmful One of the weaknesses of this approach to stress management is that it ignores employee capacity to meet the demands coping skills and employee expectations It also ignores other factors in the work environment that may improve the ability to cope Mann et al [2] found the tool to be insensitive – detecting less than 40% of those with psychological strain (those suffering from work stress) in everyday

In contrast the Naval Service stress research programme is *outcome* based it focuses on the identification of cases of anxiety and depression and then searches for occupational stressors that are linked to strain It also seeks to identify stress *buffers* – aspects of work life that improve the ability to cope with work demands

Anxiety and depression (minor psychiatric ailments) can be measured using a variety of psychometric survey instruments The current programme utilises the twelve-item General Health Questionnaire(3) (GHQ 12) The main advantage of the GHQ 12 (apart from its brevity) is that it is valid reasonably reliable and widely used This means that comparison data on strain rates are available in the literature from a wide range of occupations Such data aid interpretation Anxiety and depression are normal human emotions most people experience them from time to

time end [illegible] revalence [illegible] athc [illegible] ero] is for [illegible] al [illegible] well

Physical Effects of Psychological Strain

Emotional distress is characterised by autonomic nervous system arousal and endocrine responses. Loss of control, learned helplessness and depression are associated with activation of the pituitary adrenocortical axis resulting in increased blood cortisol levels. Cortisol acts as an insulin antagonist, increasing insulin resistence (IR) at a cellular level. IR is a condition in which the effect of insulin on glucose uptake by the muscles and fat cells is diminished. Less glucose is available to the cells for metabolism, blood triglycerides increase and HDL cholesterol concentrations lowered while LDL increases and the blood sugar level is chronically elevated. The evidence is that stress increases cortisol secretion and one effect of this is IR. Chronic exposure to stress leads to chronic overproduction of insulin – eventually the system can break down leading to Type II diabetes as the Islets of Langerhans in the pancreas no longer produce sufficient insulin. [illegible] the blood sugar rises after a meal. Heavy *chronic* psychosocial stress at work may have serious health implications for those exposed to it.

The consequences of insulin resistence include increased levels of VLDL and LDL cholesterol particles in the circulation. Other risk factors include Type II diabetes and [illegible] factors (high blood pressure). Over time the amount of abdominal fat increases. IR is thought to be associated with a [illegible] of biochemical [illegible] that produce [illegible] a substance [illegible] breaks down [illegible] cular fibrin clots [illegible] substance that [illegible] of in the clotting [illegible] differences [illegible] analysis are [illegible] elevated [illegible] fibrinogen levels. The presence of all of the above is sometimes referred to as *metabolic syndrome* (4).

It has been demonstrated that there is evidence for social gradients in insulin resistance and raised blood fibrinogen levels and a clear relation with heart attack due to coronary thrombosis or stroke(5). Fibrinogen has a role in blood clotting so the higher the levels the more likely you are to get a heart attack or stroke due to formation of blood clots. The Whitehall II studies (see below) have demonstrated that a lack of control at work is one of the causal factors (controlling for other risks such as smoking and diet).

Models of Psychosocial Stress

The two most well researched models in relation to health are Karasek's Demand Control Support model(6) and Siegrist's *Effort Reward Imbalance* (ERI) model(7). Karasek's model predicts strain when job demands are high and when employees have little control over their work (Figure 2). Social support from management and/or co-workers acts as a buffer to mitigate the effects. The HSE's risk assessment tool draws heavily on this model.

Siegrist's model focuses on the relation between the *extrinsic effort* required to do a job and the rewards of the job. Strain occurs when the employee perceives there to be an imbalance between effort and reward. Extrinsic effort equates roughly with job demand. Jobs have intrinsic rewards be they financial, social or job security. ERI also distinguishes between extrinsic and intrinsic effort. Intrinsic effort is a coping strategy – excessive intrinsic effort is a pattern of excessive striving in combination

		Demands	
		Low	High
Control	High	Low Strain Job (e.g. artist/musician)	Active job (e.g. entrepreneur executive)
	Low	Passive Job (e.g. cleaner, cook)	High strain job (farmer, teacher)

Figure 2. Typology of Jobs by Demand and Control

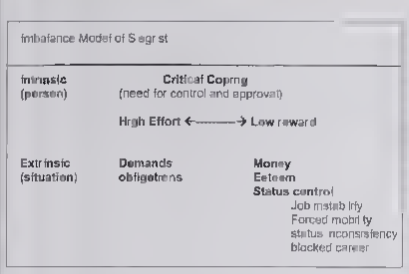

Figure 3

w th a strong desire for control and of be ng approved and esteemed The model pred cts that stra n w ll occ r when there s an mbalance (F gure 3) H gh m nt s c effo t s known as overcommitment and s characterised by diff cul y n disengaging from work. Hgh stram nd viduals are o ed cted to be overcommitted nd v duals who perce ve there to be a lack of bala ce between effo t and reward (possibly d e to low pay o a blocked career path)

There s ev dence that both these n odels can explain some of the va ar ce n health outcomes n working populations as is described below

The Lnk w th Psychosocial Stressors

Bosma et al (8) obtained measures of job control (both self reported or ndependently assessed) from 10308 UK civil servants in the Wh tehall II study at baseline and subsequently They then obtained nformation on coronary heart d sease (CHD) ncluding new cases of angina (chest pain on exert on) severe pain across the chest d agnosed s chaem c heart disease and other coronary events over a per od of 5 3 years. Low job control was associated w th an ncreased risk of CHD (a 1 5 1 8 t mes greater r sk) The ncreased risk could not be explained by sen or ty (grade) negat ve affect v ty (low mood) or class c coronary r sk factors Bosma

combination o l gh [illegible] rewards also mo e than [illegible] of these job stra [illegible] of each othe wh lst h [illegible] such as br ok ng were sen or ty n the orga sa [illegible] subjects were co per [illegible] overcommitted to he [illegible] control and a block [illegible]

Essentially these [illegible] that s nificant y n or [illegible] heal h outcomes c [illegible] con b n ng hc psycl [illegible] n other words t [illegible] s ng d fferent ter [illegible] sa ne stressors

Stans ted et al 1 [illegible] d a acute stress [illegible] 10308 civ l serva ts [illegible] Dec s on l t tc (la [illegible] d scret on) job [illegible] were measured [illegible] 1985 88 1989 a [illegible] mbalance was as [illegible] d sorde wh r [illegible] exter ded ve o [illegible]

At [illegible] worr e were inc [illegible] comb ned v h gh y [illegible] w n a f gh sk o r y l

Effort o v d [illegible] associated w f [illegible]

(OR=2.64 2.3 [illegible]). Change in work characteristics was also associated with changes in psychiatric disorder in [illegible] directions. [illegible] social support improvement [illegible] associated to lowered risk of disorder [illegible] but not in women. Increased job [illegible] associated to a greater risk when [illegible] [illegible] [illegible] decision authority [illegible] [illegible] of disorder in [illegible] (OR 1.26 [illegible]).

This short review of the literature on stress [illegible] the Naval Service [illegible] a short history of which [illegible] to the INM report published at [illegible] time is presented below.

Brief History of Naval Service Stress Research

1998 INM received the first request for a stress audit from the then Directorate of Naval Service Conditions. The goal was to establish current levels of stress and to determine the extent to which personnel were suffering the effects of stress. The identification of high risk groups was also a priority. A further requirement to identify whether stress was becoming more severe could not be met as there was no previous research or baseline data for comparison.

1999 The first stress survey was carried out(11). Key stressors identified were work/family conflict, role conflict, poor physical work environment, a lack of autonomy and control, poor support from supervisors and peers and lack of resources. The prevalence rate of strain in the Naval Service at 32% was found to be greater than in the general working population (18%). Significant differences in strain rates were observed within the sample. Higher rates were reported by females (43%) than males (31%) and those serving in ships/submarines than those at shore establishments. Significantly lower rates were reported by RN officers compared to RN ratings and by those aged 25 and older compared to those under 25 years. RN female ratings aged under 25 serving in ships reported the highest levels of strain (72%)(12).

The recommendations included a call for improvements in the provision of:

- the Divisional System for females particularly at sea
- a coordinated and comprehensive workplace stress education programme for the chain of command
- chaplains on all deployed units, and
- publicity to promote NPFS and the Naval Supportline

2000-2001 Regular stress audits were proposed in order that the effects of any changes might be monitored. A pragmatic decision was made to combine a stress audit with the yearly Continuous Attitude Survey (CAS). CAS response rate dropped from 37% to 32%. Surveys designed to estimate prevalence require response rates of at least 50% and so the proposal to conduct regular stress audits using the CAS was abandoned.

2002 INM tasked to repeat 1999 survey (13).

2004. Second stress survey. Strain prevalence was 34%. The overall distribution and prevalence of strain was unchanged. Stressors linked to strain: Role conflict (all), physical work environment (females), work family conflict (males). Commitment to the Naval Service had a protective ('buffering') effect. Hours of work and lack of resources, although sources of dissatisfaction, were not linked to strain.

2005 The findings of the previous studies were reviewed in a series of presentations to senior management. Although the previous research had yielded some useful information it was recognised that strain had not been properly contextualised in relation to the main goals and challenges facing the Naval Service. However, it was recognised that, although not well understood in the NS, strain was a [illegible] concept. It is part of the causal chain of many other processes which were acknowledged to be important. A decision was made to carry out a cohort study to determine whether strain was linked to PVR, to medical downgrading and to other adverse events.

important to determine the prevalence rate of chronic strain and its effects.

2006 The literature on occupational stress, strain and health was reviewed once again with particular emphasis on the constructs and methods used in longitudinal research. The Work and Well Being Questionnaire (WWBQ) used in the previous studies was redesigned and subjected to a rigorous psychometric analysis (14), including test retest reliability. New sub scales were developed to include perceived imbalance between effort and reward, overcommitment, exposure to stressful life events outside of work, mood coping style and self reported health complaints and lifestyle factors (such as exercise and smoking).

2007 WWBQ (coded against service no.) was posted to 5000 NS personnel (Jan–Mar). The strain prevalence rate was 31.5%. Strain was higher in ratings than officers and in females than males. The main stressors linked to strain were: Effort reward imbalance, Role conflict, number of stressful life events, Stress buffers, over-commitment, difficulties in disengaging from work), low commitment to the RN. The psychological strain rate for the Naval Service as a whole was slightly lower than in previous surveys at 31.5% (possibly due to the poor response from personnel under 25 years of age). The survey investigated a wider variety of possible stress factors than previous surveys and these newly investigated stress factors accounted for the greatest percentages of the variance in strain. Personnel suffering from strain tended to be; over committed to work, unable to disengage, had low levels of commitment to the Naval Service, a low mood state and had suffered stressful life events outside of work in the last twelve months. In addition to reinforcing previous recommendations about the management of role conflict and the need for good leader support, the study enabled new recommendations for stress management to be made (15). These included the management of overcommitted personnel and the need to foster commitment to the service [illegible] role should be managed by [illegible] feedback, reducing long hours, [illegible] annual leave allowances [illegible].

In July 2007 GHQ 12 (strain questionnaire) [illegible] to all who responded to the Jan/Mar 2007 survey. For the 52% of personnel who responded to this follow-up survey the prevalence rate of strain was 30%. The short form (variable) [illegible] (chronic strain) was 16.8%. Therefore [illegible] point of chronic strain is approximately 50.

Review of the main research findings

Strain rates were slightly lower in 2007 than in 1999 and 2004. The Effort Reward Imbalance model accounted for a greater proportion of strain than the Demand Control Support model. Combining elements of both theoretical models produces the best empirical model of strain in the Naval Service. In practical terms, stress management initiatives that focus only on work demands and how they are managed will be incomplete. A more complete approach will focus on balancing work demands whilst fostering a climate of fairness and reciprocity. The evidence base for stress management initiatives in the Naval Service has improved as can be seen from the 2007 survey regression models of strain. These models account for almost double the variance in strain compared to those of previous surveys.

A small but significant proportion of the strain in the Naval Service personnel (about 10% of the explained variance) was not directly work attributable associated with the occurrence of stressful life events. It appears that work family conflict is only stressful when things go wrong.

The advantages of changing from a cross sectional survey approach using anonymous questionnaires to a prospective longitudinal approach using questionnaires coded against service numbers immediately apparent. The first follow up survey has indicated that the one month prevalence rate of strain is almost 50% of the point prevalence rate measured cross sectionally. The reasons for this difference may only be a matter for speculation at this [illegible] but the data are of considerable potential

[illegible]

Current activities in 2008

[illegible] further analysis [illegible] data is underway [illegible] the demographic [illegible] chronic [illegible] without strenuous [illegible] of the variables [illegible] episodes [illegible] diary analysis [illegible] the NS [illegible]

Obesity [illegible] of the NS [illegible] self reported [illegible]

[illegible]

Breaking the obesity figures [illegible] and sex shows male [illegible] the obesity prevalence [illegible] rates (17% v 8.5%) [illegible] of age were over [illegible] obese than females. [illegible] twice the obesity rates [illegible] counterparts (22.9 v 10.[illegible]) [illegible] officers had zero obesity [illegible] of RN officers [illegible] representative of the [illegible] have a lower obesity [illegible] 30 and 25 respectively. [illegible] representative of the [illegible] rates of overweight and obesity [illegible] 70 [illegible]

[illegible] of the variation in the BMI data was accounted for by status or by any of the [illegible] factors discussed above. Age [illegible] for one or more of the [illegible] suggests that obesity in the [illegible] to lifestyle factors rather than [illegible] of maladaptive coping [illegible]

[illegible] the advantage of conducting a [illegible] is that males [illegible] the younger age [illegible] follow up questionnaires [illegible] whether the [illegible] BMI that [illegible] linked to the [illegible] the 2007 WWBQ [illegible] the possibility to identify [illegible] psychosocial, physical and [illegible] 2003 [illegible] obesity and/or [illegible] found that [illegible] psychological strain) was [illegible] physical inactivity and the [illegible] alcohol, tobacco, cannabis [illegible] young Norwegians [illegible] the armed forces. The [illegible] associations in the NS [illegible] shed light on the process [illegible] and physical disability [illegible]

[illegible] to pursue such hypotheses [illegible] data from the present [illegible] personnel [illegible] downgraded [illegible] or obese [illegible]

Sickness Absence [illegible] respondents [illegible] absence during [illegible] reported [illegible] 12% failed to [illegible] 37% of respondents [illegible] one period of [illegible] days in duration [illegible] reported [illegible] of absence [illegible] longer than 7 days in the year 2006-07.

Twenty eight percent of males reported at least one period of absence lasting less than seven days compared to forty one percent of females. Eight percent of males reported at least one period of absenteeism lasting more than seven days compared to fourteen percent of females. This sex difference in absenteeism is to be expected as it has previously been found that illness related absenteeism is higher in females than males (18, 19). Both acute and chronic (6 month) strain sufferers were more likely to report absenteeism in the last year and were more likely to be medically downgraded (i.e. non P2).

Analysis of other self reported health data (smoking, alcohol units, exercise, absenteeism, general health, medical category, CVP, HP, diabetes, depression, musculoskeletal disorders and minor illness) to generate descriptive statistics and investigate links with strain is also underway.

One-year prevalence of strain. At the time of writing, the GHQ 12 questionnaire is being re-sent to all personnel who responded to the Jan/Mar 07 posting of the WWBQ, together with a newsletter describing the findings to date. Should the response rate exceed 50%, the 12 month prevalence of strain will be reported.

Conclusions

Psychological strain is not randomly distributed across Naval personnel. It is higher amongst younger personnel, in some female subgroups and in some personnel serving at sea. It is linked to high external demands, particularly when reward and recognition are perceived to be low and to high internal demands in highly motivated people. It is also linked to the [illegible] medical [illegible] excluded [illegible] likely [illegible]

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General

The influence of military threats on the design and use of the Royal Naval Hospital Haslar

P J Buxton

Abstract

The twin demands of the medical and security requirements influenced the original design of RNH Haslar. Over time the structure was altered to accommodate changes in the military threat and these changes can be identified from original plans and the extant structures. The use of spatial analysis through the use of justified access graphs can provide insights into the way the building was used and how it influenced the relationships between the staff and the patients.

Introduction

We shape our buildings and afterwards our buildings shape us. Winston Churchill 28 October 1943

The Royal Naval Hospital Haslar, now known as the Royal Hospital Haslar, is one of the best preserved Georgian hospitals and grounds in the country. Its simple appearance now much loved, arose not primarily from an aesthetic desire but for pragmatic military and fiscal reasons. The aim of this paper is to show that the original design and subsequent modifications to the Royal Naval Hospital Haslar were influenced by the contemporary military threat, that this design had a direct effect on mitigating this threat, and that the changes in the type of threat over time led to identifiable changes in the extant fabric of the buildings and grounds.

A military threat should not be limited to physical attacks on people or units (kinetic effects) but should include all events that adversely affect an organisations ability to carry out its functions. The loss of manpower from desertion in the eighteenth century, an example of a non kinetic threat, was significantly underinvestigated as a capability. This paper will show how the buildings at Haslar were used to counter both kinetic and non kinetic threats.

The typically simple Georgian façade of the main hospital building conceals a complex building layout with numerous lobbies and access routes to the wards and outdoor exercise areas. In order to compartmentalise this building with other contemporary institutional buildings such as hospitals and prisons techniques must be used to describe the underlying structure of these buildings. Spatial analysis seeks to understand a building by reducing it to a series of interconnected nodes and identifying which of the different classes of occupants have access to them. Justified access graphs developed by Hillier and Hanson [1] are a way of simplifying a building to better understand its layout and to determine its permeability, that is the ease with which people can enter, move around within it. They can be used to compare well different structures in order to identify underlying patterns.

In a private building such as a house the deepest spaces are normally the private ones such as the bedrooms, all is those spaces that are exclusively occupied by those who control the building i.e. the owners. In these buildings visitors are confined to the shallow spaces, although honoured guests may be permitted to enter the deeper spaces. By contrast the shallower spaces of institutional buildings such as prisons or workhouses are occupied by those who control the building such as warders, whilst the deep spaces are the cells are occupied by the prisoners or the inmates. A deep space could be seen as

Historical Background

In common with the civilian p[illegible] time, naval patients in the early e[illegible] century were normally treated [illegible] houses and lodgings or, if suffic[illegible] were sent to decommissioned [illegible] that served as hospital ships. S[illegible] were far from ideal and on the [illegible] 1744 the Navy Board petitioned th[illegible] authorise the building of hospitals [illegible] at Portsmouth, Plymouth and Chatham [illegible] cited as the main reason that [illegible] such hospitals is so sensibly rel[illegible] Majesty's service suffers so greatly [illegible] loss of seamen, either by death or desertion, who are sent on shore for the cure of the[illegible] distempers.' [2] The dual requirements for the hospital as a place of healing and [illegible] are evident therefore at its [illegible] and would require compromises in its design to accommodate this duality. Preventing desertion was not the only security consideration as there was also concern that [illegible] recovery was hampered by [illegible] The hospital's design would have [illegible] the smuggling of [illegible] liquor. The Navy Board agreed that [illegible] for all three hospitals to [illegible] Portsmouth was the most [illegible] hospital to house [illegible] could be no more than [illegible] £38,000. [illegible] coincided with [illegible] civilian hospital building [3] [illegible] there was a hospital in [illegible] Britain.

S[illegible] land reclamation [illegible] the outline of the [illegible] were [illegible] hospitals [illegible] evidence from early maps [illegible] the coastline may [illegible] hospital was built [illegible] Figure 1. [illegible] suggest that the hospital would have been [illegible] more isolated than its present-day appearance would indicate.

Figure [illegible]

There are [illegible] four ranges [illegible] courtyard [illegible] U-shaped civilian hospitals being constructed at the time. For example, the London Hospital (1740) was built as [illegible] and the conversion [illegible] London [illegible] Lanesborough House to form St Georges Hospital, London (1733-39) resulted in an H shape. This variation from the civilian norm was [illegible] ably to provide more secure accommodation for the military patients.

Building started on the North East range in 1746 and patients were moved into it in 1754; work then continued on the two side ranges which were completed by 1762. The fourth range was never built and this is usually attributed to a lack of funds as the cost of the building had by then climbed to £100,000. The final form of the hospital therefore took a conventional U form and Tait [2] considered that this had [illegible] advantage as it allows free access of both sun and air, which would not have been the case had the building been completed to the original plan.

The hospital was not, however, particularly secure. Admiral Keppel, in a letter from HMS Victory in 1778 [4], to the First Lord of the Admiralty wrote that 'The insufficiency of the invalid guard at the hospital [Haslar] has allowed of more desertion from it than before'. In 1796, to improve security, railings were installed to complete the square and close off the [illegible] quadrangle. Although the use of impressment declined at the end of the Napoleonic wars the railings were not removed until 1906. A [illegible] perimeter wall was

constructed in the mid eighteenth century and was extended to encompass the paddock to the south west of the site. In 1857 Although there was significant military activity in the nineteenth and early twentieth centuries there was no direct threat to the hospital. The changes on the site during this time such as the building of the Zymotic Block (for infectious cases) and the Sick Officers Block were all therefore medically related. Separate staff accommodation was also built so that they no longer needed to live within the main hospital building.

Military Threat Analysis

Desertion was clearly a problem in the early history of the hospital: the Hospital Instructions for Haslar and Plymouth state (5) "Centinals [sic] are to be stationed around the hospital to prevent desertion or damage to walls". Even though impressment was effectively discontinued in 1815 this much criticised practice was still an option for the naval authorities: the last parliamentary impressment bill was passed in 1835. Loss of personnel from the Royal Navy must have remained a problem as the 1854 hospital police instructions [6] instructed that: "the utmost diligence is to be used to prevent the Desertion of Patients".

Hospitals are by tradition and latterly by International treaty protected from direct military attack. Haslar occupies land which together with the adjacent Fort Blockhouse site commands the narrow entrance to Portsmouth harbour. Therefore whilst it would have been unlikely that the hospital would have been attacked during the nineteenth century for its own sake it could have been threatened because of its strategic position. As the effective range of artillery increased the defensive value of the forts and land close to the harbour became ineffective and in 1859 a Royal Commission advocated the construction of an outer defensive ring of forts around the harbour. As Haslar lay within this defensive ring it was thus protected from military attack.

With the development of aerial bombardment in the Second World War however the hospital was no longer safe. Although the hospital was never targeted directly its proximity to the military dockyard made it vulnerable. Several bombs dropped on the site one of which destroyed the pavilion between E and F Block. This housed the museum and resulted in the loss of the botanic and other specimens collected during the voyages of amongst others HMS Beagle.

The possibility of an attack continued into the Cold War where again the proximity of Haslar to Portsmouth Naval dockyard as prime target for a nuclear or conventional bomb made it liable to collateral damage. In reality had the former been used the hospital would have been within the zone of complete destruction. The Cold War also saw the possible use of attack from biological and chemical weapons. Had those been used on the adjacent Naval Base Haslar would have been affected.

The possibility of a direct terrorist attack on the hospital developed from the early 1970s to the present initially from the Irish Republican threat and latterly from other international terrorists. The Abercrave Park Hospital, Belfast in November 1991 which killed 2 members of the Royal Army Medical Corps and injured 7 others showed that this was a very real threat. Although it was assumed that any such attack would be against the military living accommodation rather than the clinical areas the close proximity at Haslar meant that the whole site had to be protected.

Over the life the hospital the airfare the predominant military threat has changed from a largely internal one requiring control of the patients to one that required the patients and staff to be protected from a potential external threat. The following sections will show how the hospital was built to alleviate or counter these threats.

Influence of desertion

In the perception to the King the Navy Board clearly recognised the need to provide a secure location. In building Haslar the threat of desertion was countered by the very location the design of the building itself and the perimeter wall.

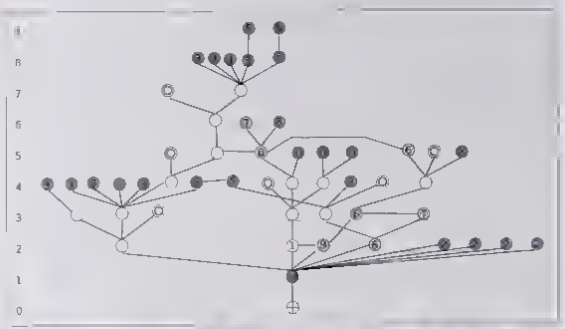

Figure 3

T e focation for Haslar was chosen to offer a significant degree of isolation An orig nal plan shows that the hospital would have been surrounded on three s des by water The only land connection to the south west of the s te was an area of creeks and ponds which would have been difficult to c oss and would have further isolated the s te and impeded escape Physical isolation of hospitals of th s period was not unique to Haslar Most hospitals of the per od were bu lt n the f elds surrounding the con tbar on they served Such isolation was seen as an important protect on from the pernicious m asma that emanated from the and was believed to cause disease The psycho cal isolation at Haslar therefore served both a mil tary and a med cal purpose

The mitnal phase of building was of the main north east frontage (Blocks C & D) and patients were moved in as soon as it was completed Figure 2 shows th s n tial bu ld ng phase as a just f ed access analysis graph with the key shown in Figure 3 Th s shows that the spaces occup ed by the pat ents are at the deepest e the most secure or private part of the bu ld ng and that the more senior staff occupy the shallowest or controlling spaces

Two problems can be identified from these graphs firstly many of the wards are parts of circulat on spaces re they could be used as a corridor secondly the wards are not very deep w thin the structure re it would be relatively easy to escape from the wards The subsequent addition of the two side w ngs whilst increasing the capacity of the hospital d d not affect ts permeability or the spatial relationsh ps between the staff and pat ents

[illegible] a proble[illegible] [illegible] growi[illegible] [illegible] [illegible] area between the [illegible]

Examination of the walls around the pavilions however strongly suggests that changes were made to block off these passages. The walls of the arches between [illegible] & B blocks (Figure 4) clearly shows evidence of scarring on the brickwork suggestive of metal grill in the upper portion and stone [illegible] in the base (not shown) could indicate repair of the plinth following the later removal of a solid wall. There remains between the inner and outer ranges of F Block a wall and upper grill whose dimensions match the scars on the wall between A & B block (Figure 5). In addition there is a hole in the stone work at the apex of the arch in the F Block range. This is interpreted as the site of a bolt hole that would have secured a central gate.

The overall interpretation therefore is that [illegible] the [illegible] across the fourth side of [illegible] adrangle was built the connections [illegible] courtyards and the main [illegible] grounds were secured with a stone [illegible] grill with a central gate at [illegible]. This would increase the depth [illegible] courtyards and quadrangle [illegible] Figure 2 but would have only a [illegible] on the depth of the wards. [illegible] above [illegible] as the deeper spaces [illegible] security. [illegible] building works described [illegible] the security [illegible] would [illegible] works would be done in [illegible] security [illegible] block [illegible] wards [illegible] increases [illegible]

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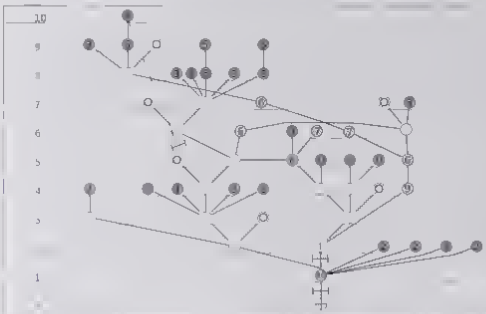

Fig 1c

pattern is not entirely pure however [illegible] ward staff had to be located close to [illegible] wards in order to carry out their [illegible] function.

The outer security of the Haslar [illegible] provided by the perimeter wall dating [illegible] mid eighteenth century and therefore [illegible] contemporary with the construction of the main part of the hospital. The wall remains largely intact on the north east and north west margins of the site; its original form on the south-west margin is difficult to discern due to the later construction of the Officers Terrace (1796). Its appearance in 1809 is shown in a watercolour sketch by a soldier from the 2nd West Yorkshire Militia, John Durant, who was stationed at Haslar Barracks. This sketch of the north east aspect of the site shows that the perimeter wall is lower than today; the current appearance of this wall is shown in Figure 8. There is a clear change in the colour of the bricks in the upper part of the wall to the left of the picture where there is a building against it. This building is one of a pair of storehouses built in 1853; the change in the brickwork must mean the height of the perimeter wall here was increased to accommodate the building rather than to increase the security as the height of the perimeter wall elsewhere remained unchanged.

By the middle of the nineteenth century plans of the hospital show that several openings had been made in the perimeter wall, for example to the Works area in the north corner of the site (shown as a bricked up gate to the right of Figure 8) and in the [illegible] wall giving access to the cemetery. Whilst these entrances could have been in their lowered or guarded [illegible] that at the [illegible] [illegible] period of [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] These [illegible] probably more [illegible] collapsed. There [illegible] brickwork and they are made [illegible] brick as the rest of the wall. The [illegible] is therefore that they are contemporary [illegible] the main construction phase of the [illegible] are not a later addition. The [illegible] the paddock is securely dated by a incorporated date stone to 1857. [illegible] surrounding the cemetery is [illegible] must post date the consecration of the cemetery in 1826 but there [illegible] requirement to incorporate [illegible] loops at this time as there were [illegible] military threat. A later date of 1857 [illegible] construction of the cemetery [illegible] more sense as there was [illegible] time that a French army would land to the west of Haslar and seize the peninsula in order to [illegible] of the [illegible] entrance. These gun loops would have provided an effective field of fire over the paddock area which would be the logical route of an invading army.

The majority of the gates that were [illegible] in the wall were later bricked up [illegible] date [illegible] but presumably reflected a growing concern with the external threat. Haslar is adjacent to a motor torpedo boat base and [illegible] submarine base and [illegible]


Figure 8


Figure 9

whole a [illegible] to have [illegible] to surface if out [illegible] have [illegible] The [illegible] seal the [illegible] high standard [illegible] and out around [illegible] old War rather than later.

Influence of aerial bombardment

There are deep cellars extending under all of the main blocks of RNH Haslar but there are no cellars under the outlying blocks such as the Sick Officers Block, Zymotics Block and the staff accommodation areas. In the Second World War the cellars under the main hospital would have provided good protection from all but a direct hit and there is photographic evidence that they were used as emergency operating theatres. They may also have been used as temporary wards but no photographic evidence for this has been discovered. From a practical point of view it is unlikely that patients were accommodated in the cellars permanently but would have been taken there when the air raids were most intense.

Where there were no cellars underground air raid shelters were built. A recent visit has shown them to be in an excellent state of preservation with sound concrete walls and no significant water ingress: the built in bunks and seating are in almost perfect condition. The shelters adjacent to Zymotics Block and the accommodation blocks have vertical internal walls made from concrete poured in situ and are entered by a steep set of stairs. There is a vertical emergency escape ladder at the far end of each shelter. Each shelter has about 20 fixed spaces but could accommodate more if necessary. The shelter adjacent to the Sick Officers Block uses the slope of the ground to provide an alternative entrance arrangement. It is built with about half of its height above ground level and internally it has a circular cross section with the walls constructed from pre cast concrete. There is a large mound of earth covering the above ground portion. The shelter is composed of two connected wings with three entrances and one emergency exit.

The interpretation of these differences is that the shelters adjacent to the Zymotics Block and accommodation buildings were used by only a small number of people, possibly only staff who were off duty whilst the shelter next to the Sick Officers Block would have to be used by both the patients and staff. The latter type of shelter however would have taken more resources to construct than the completely underground type used elsewhere. There are no shelters associated with the main blocks of the hospital presumably because the patients and on duty staff would have used the cellars for shelter.

The plans to use the cellars as shelters continued into the Cold War period as there were instructions to staff about the use of the cellars in the event of a Soviet attack. As the cellars are not hermetically sealed they would only have been of any benefit in the event of a conventional attack. They would not have provided any defence against a nuclear, biological or chemical attack. The only remaining visible reminder of their use is a shelter sign at the end of B Block.

Influence of terrorism

The main terrorist weapon is the improvised explosive device (IED) which is required to be placed in close proximity to the target. The principal defence against such a threat is in preventing the terrorist from gaining access to the site. Since Haslar also acted as the local civilian hospital restricting access was difficult. Although this threat is relatively recent the threat of direct assault has been present since the middle of the nineteenth century as has already been discussed with respect to the gun loops in the external wall. Access control was effected by securing the perimeter of the site against unauthorised entry and so the limitation on the number of access points into the site persisted.

Although a new main gate was created in 1980 on the north-west perimeter as part of the Cross Link construction, the old main entrance was closed and only used for ceremonial purposes. The earlier closure of entrances created in the nineteenth century ensured that there continued to only be one

route into the hospital which was and is permanently guarded. At times of heightened threat in the 1980's sandbag revetments were added to the gate defences to provide cover for the armed sentries. The threat on the mainland was never however considered severe enough to construct permanent pill boxes such as those found at the Army hospital at Musgrave Park, Belfast.

The original perimeter walls around the main part of the site are of sufficient height to prevent unauthorised access however the sections along the south east adjacent to the sea wall had been lost or reduced in height and those built around the paddock in the south west part of the site were too low to provide an adequate defence. These weak spots were reinforced with the construction of a wire fence topped with rolls of barbed wire. The gap between this fence and the original wall was kept clear of obstructions and is illuminated at night in order to provide a further deterrent to unauthorised access.

In 1991 the IRA attacked Downing Street with mortars. The change of tactics to these indirect fire weapons meant that the perimeter defences at Haslar were inadequate to protect against this new threat. Those parts of the perimeter close to the accommodation areas which were considered to be at highest risk were strengthened with additional fencing to increase the height of the parimeter as a defence against mortars. At the same time additional gates were placed at the main entrance which could be closed at times of heightened security in order to completely seal the site. The threat from IEDs remained and precautions were taken to reduce the places where these weapons could be hidden. The ground level vents which led to the basement of the main hospital blocks were sealed with additional surface level gratings to prevent IEDs being placed next to this building.

Conclusion

The design of RNH Haslar has had to encompass both military and medical requirements which whilst not wholly incompatible certainly required compromises to be made. These requirements altered over the subsequent 150 years and the fabric of the hospital and the way it was used had to alter to accommodate these changes. Such is the level of these changes such that only fragments of requirement for guards are only known because of documentary evidence whilst for others the only evidence is in the fabric of the existing buildings. The most striking change was that of a perimeter threat was an internal one of desertion and disorder which altered in the late nineteenth century to an external threat of bombardment or direct assault. Consequently the defences have had to change from inward looking to outward facing and this is reflected in the material remains and the documentary evidence.

The defences against the internal threat were not just the perimeter wall but the whole design and use of the hospital wards were placed deep in the structure and were locked exercise areas were enclosed and the whole site was guarded. The construction of Haslar corresponded to an active period of hospital building with much experimentation with various designs the Royal Navy was in the vanguard of this change with Stonehouse being the prototypical pavilion style hospital and Haslar echoing the enclosed spaces associated with prisons.

Both Haslar and civilian hospitals of the period show that the spaces occupied by patients are the deepest ones but the respective meanings of this are different. At Haslar this depth is related to a requirement to control the patients and to prevent them escaping. At the civilian hospital there is no requirement to prevent the patients escaping and the depth of the wards is used to control access to the patients and allow them some privacy. It should be recognised however this is an interpretation based upon modern medical practice and that the original power relationships between staff and patients could have been very different. It would be equally valid to recognise that civilian spaces are controlled by the staff although not in a less powerful way than the military and that the design reinforced this control.

Current academic debates centre around how much a building can control people and influence the power relationships between

flagstones over which the wounded from Trafalgar passed is a profound experience. In its more than 250 year history the Royal Naval Hospital Haslar has been shaped to cope with changing requirements and in its turn over the last 26 years it has shaped the author.

Afternote

This article is a shortened version of the author's MA dissertation which is available at pjbuxton.googlepages.com

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General

Applying for ethical approval from the MoD Research Ethics Committee

R Linton

Introduction

For all human research you must consider the ethical implications. As a broad generalisation the most important question to answer is: Do the potential benefits justify the risks? Clearly if the risks are considerable because of the likelihood and/or magnitude of an adverse event, then the benefits must be correspondingly great. Even if the risks are insignificant (for example in the case of some questionnaire studies) it is unethical to waste people's time participating in worthless research. Similarly it is important to be sure that the knowledge being sought does not already exist (one of the advantages of a literature review).

The purpose of this article is to shed light on the process of ethical review of MoD human research rather than to provide a comprehensive account of the ethical principles involved and its standard format. A discussion of ethical principles and references to further publications and websites can be found in the Royal College of Physicians publication 'Guidelines on the practice of ethics committees in medical research with human participants' (4th edition – September 2007 (www.rcplondon.ac.uk/pubs) and on the National Research Ethics Service website (www.nres.npsa.nhs.uk).

The researcher must be familiar with the details of human research and observe basic practical ensuring that the first consideration is always the well being and rights of the research participants. Further ethical considerations include aspects of study design or recruitment participant information and consent and compliance with the Data Protection Act 1998.

More information and discussion can be found at www.scienceandethics.org.uk.

Research Ethics Committees (REC)

RECs are a relatively recent feature of Medical research has been [illegible] centuries but the Human Tissue Act committed during the 2nd World War and the Nuremberg trials from which the Nuremberg Code (1947) was developed. It derails ethical principles which [illegible] observed when carrying out research. Since that time numerous scandals have been produced and legislation [illegible] important to realise that the [illegible] research is not a standard [illegible] subject. For example, [illegible] unnecessary to obtain [illegible] experiments or one's own [illegible] RECs have to be concerned only with [illegible] Committee Authority.

MoD Research Ethics Committees (MoDREC)

Currently all human [illegible] funded or sponsored by MoD [illegible] one of three RECs: MoD PCT parallel committees MoDREC [illegible] Protection and Ethics Committee MoDREC(PPE) and MoDREC(Gen) abbreviated to MoDREC(C) [illegible] exception of diving and [illegible] which is submitted to MoDREC(Gen). human research carried out [illegible] reviewed by the Joint Service [illegible] MoDREC(PPE) meets every [illegible] human protection [illegible] of the [illegible]

[redacted]

Risk and MoD research

[redacted]

About MODREC(Gen)

At the time of writing there are [redacted] members of the committee. They include [redacted] physiologists a headmistress two lawyers a clergyman a pharmacologist five medical practitioners a psychologist and two further lay members.

There are six meetings a year four of these are held at MoD Whitehall one at the Centre for Aviation Medicine RAF Henlow and one at the Institute of Naval Medicine Alverstoke. The two meetings outside Whitehall allow committee members to visit these research establishments and learn about the research facilities available and the challenges faced. For example this is important as members should know what a decompression chamber looks like and that they have seen the limitations and experimental adversities.

In addition to scientific awareness of the type of research carried out the committee needs to be aware of current thinking and practice concerning the ethics of human research and so invites outside speakers to talk on relevant topics.

Applying to MoDREC(Gen)

I shall give an overview of the process of applying to MoDREC(Gen) but more detailed guidance can be found at www.science.mod.uk/ethics/ethics.htm where the following documents can be downloaded:

- JSP 536 Ethical conduct and scrutiny in MoD research involving human participants
- Application for MoDREC Approval
- MoDREC Application Form Guide
- Schedule of Approved Procedures
- MoDREC Terms of Reference
- Independent Medical Officer Guidance

If you have limited experience of research it is important to seek guidance from your supervisor about how to write the protocol. This is an important document. The application form acts as a prompt for much of the information required but the background information including literature review need to be the research aims and hypotheses methods statistical analysis recruitment information for research participants and consent form. All requisite levels of thought. Any subsequent proposed deviation from the protocol will need to be submitted for review by MoDREC.

When you submit a protocol it will be reviewed initially by one of the four Scientific Advisory Committees (SAC). There is a SAC for each of the Army RN and RAF and in addition there is a further committee for Hyperbaric and Underwater Research (HURSAC). Many of the members of these committees are MoD employees so they are not independent and nor can they be since for example only the RN knows about the need for a new submarine escape system. The chairman of the relevant committee will e mail you with comments that need to be addressed. The SACs will provide an overall opinion about the

protocol but are particularly concerned with the need for the research (e.g. has it been done before?), experimental design including scientific method and statistical analysis (e.g. will the proposed method answer the question?), safety (where relevant) and value to the military (e.g. there is no point in extending diving depth in the absence of military need). When the protocol has SAC approval it is forwarded to the chairman of MoDREC(Genf.

If you are also applying to another REC for example of the university involved in the research there is no need to wait for its approval before applying to MoDREC. You might wonder why if a protocol has approval from a university or NHS REC it needs to come to MoDREC as well. The main reason is that MoD has a duty of care to its personnel. Further considerations which are important to MoD are:

1. What is the potential value of the research to MoD?
2. Is what the participants are being asked to do reasonable in the context of their military duties?
3. Bearing in mind the hierarchical nature of the Services can one be sure that there is no coercion involved in the process of recruiting volunteers for the study?
4. Will the conclusions be valid? For example in the case of a questionnaire study will the return rate be high enough to provide an unbiased sample of the targeted population?

Review of protocol by MoDREC(Gen)

Some protocols can be approved by the chairman ex-committee. The Schedule of Approved Procedures which can be found on the website (see above) lists research procedures which are reviewed and approved annually by the committee. Research that only includes procedures described in the Schedule can be approved on behalf of the committee by the chairman who reports such approvals at the next committee meeting. This reduces the time taken for ethical approval to be obtained if a protocol falls outside the Schedule of Approved Procedures then it will be considered at the next meeting and normally the researcher(s) will be invited to attend. Either way the researcher will usually be asked to make some amendments to the protocol. The wording of the Participant Information Sheet the Consent Form and any instructions to the participants will be carefully scrutinized as will the way in which participants are recruited. Information given to participants must be accurate easily understood by them and comprehensive so that they know what they are volunteering for.

How to get help

If your protocol needs ethical approval please remember that the SACs and MoDREC are here to help you achieve it. Our role is to facilitate not to obstruct but at the same time to a high standard is required. If in the course of scientific (SAC) and ethical (MoDREC) review you think that some of the comments you get back represent misunderstanding say so! If you are dissatisfied with the way in which your protocol is processed it is important to tell the MoDREC chairman so that misunderstandings can be resolved and shortcomings in our part addressed.

No fault compensation

The MoD provides a no fault compensation scheme which applies to healthy (non patient) volunteers taking part in research which has been approved by MoDREC. This means that if a participant suffers harm as a result of taking part in research compensation will be paid without having to prove negligence.

It is extremely important for this reason and others not to carry out research without ethical approval since in the event of a participant suffering harm under such circumstances no fault compensation will not be payable.

Clinical research

In the case of research involving patients the MoD no fault compensation scheme does not

apply although in some [illegible] es no fault compensation from and le[illegible] such as the academic or comm[illegible] may be required. Claims can be made on the basis of harm resulting from negligence so the situation is no different from that in the National Health Service. Details of compensation arrangements must be made clear to potential participants in the case of clinical research. Details of the default compensation scheme which may be applied to the application form should be given to the potential participants. In the case of clinical research it must be made clear what compensation arrangements exist.

When is ethical approval not required?

Not all human research needs ethical approval. An anonymous questionnaire seeking opinion about sports facilities would not need to be submitted for review, but another that included intrusive questions about, for example, religion or sexual orientation would. A trial of a new communication system would probably not need ethical approval unless the research included the effect of the system on the individual. There is a checklist of 12 questions which can help you decide whether ethical review is needed. It can be downloaded from the MoDREC website and is reproduced below. If there is still any doubt *See Box 1 then contact the MoDREC chairman who will advise you. It is very important to seek advice rather than just hope for the best. Inevitably there are grey areas where the decisions are not obvious. If this were not the case MoDREC could probably be replaced by a computer algorithm.

Problems encountered

It might be helpful to mention some of the problems that have been encountered during the last year.

1 **Starting a study prior to obtaining ethical approval**
For studies that need ethical approval must be obtained in writing from MoDREC prior to starting the research. This includes recruitment and the processes associated with it such as advertisements and emails which must not be used until they have been approved. Approval by the relevant scientific advisory committee does not constitute ethical approval.

2 **Questionnaire studies**
These need to be carefully designed. It is important that they are validated in the target population to ensure that they are not too long or complex, that they are reliable, that the response rate is adequate and that they are sent to a representative sample.

3 **Information for participants difficult to understand**
The Participant Information Sheet must be easily understood by the target audience.

4 **Dating the protocol**
It must be easy to identify which is the most recent version of a protocol. This has by no means always been the case.

5 **Contact details**
Telephone numbers and email addresses must be accessible from outside the military.

6 **Ensure that the Participant Information Sheet is sufficiently comprehensive**
Researchers have sometimes failed to mention all the uses to which the data might be put with the result that its further use has been limited. For example, if you collect a database of information and then wish to link this with information held in a different database you must explain this in the Participant Information Sheet and obtain consent. Again if you may wish to re-contact the same research participants at a later date their permission for you to do so must be sought at the beginning.

Careful thought should be given as to what use you might want to make of

Box 1

Does my research protocol need to be submitted for ethical approval by MoDREC?

Not all human research needs ethical scrutiny. For example, there would be no need for ethical approval of an anonymous questionnaire seeking opinion about canteen food. In the case of trialling a new rifle there would [illegible] be no need for ethical approval unless the research involved studying the effect of the [illegible] on the [illegible] for example to assess the effect of the noise on hearing. On the other hand, assessment of a new protective suit in a hot environment would need ethical approval because of the risk of the participant becoming dangerously overheated.

In all cases the guidance given in JSP 536 'Ethical conduct and scrutiny in MoD research involving human participants' must be followed. If you think that your protocol does not need ethical scrutiny it may be helpful to answer the following questions. If any of your answers fall into column A then you should get advice via the MoDREC secretariat as to whether the protocol should be submitted to MoDREC.

The checklist of questions is aimed at helping you decide if ethical scrutiny is needed. It cannot be totally comprehensive so even if all your answers are in column B, if you are in any doubt as to whether ethical approval is necessary please contact the MoDREC secretariat for advice.

It is the responsibility of you/your line manager to ensure that no research requiring ethical approval is started before that approval has been given; this includes carrying out pilot studies.

	A	B
1 Are the risks to the subjects in any way greater than those to which they are exposed in the course of their normal peacetime duties?	YES	NO
2 Is there any psychological intrusion, for example personality questionnaires or recording of sensitive personal information?	YES	NO
3 Is there any physical intrusion, for example body fluid sampling or medical examination?	YES	NO
4 Will the psychological endurance of the subjects be tested beyond the limits encountered in their normal peacetime duties?	YES	NO
5 Will the physical endurance of the subjects be tested beyond the limits encountered in their normal peacetime duties?	YES	NO
6 Will any physiological monitoring be used, for example blood pressure, heart rate, ECG recording?	YES	NO
7 Will any drugs or other substance be administered?	YES	NO
8 If applicable, have all the current [illegible] safety assessments been completed satisfactorily [illegible] and throughout the ranges of environmental [illegible] in which human exposure [illegible] period?	YES	NO
9 Will the subjects be paid extra for taking part [illegible]	YES	NO
10 Will the subjects be drawn from [illegible] from the new equipment or technique?	YES	NO
11 If applicable, are Standard Operating Procedures [illegible] equipment or system?	YES	NO
12 Can the information collected be linked to individual participants?	YES	NO

If the answers to any question fall into column A, or if you are in any doubt [illegible] ethical approval is necessary, please [illegible] the MoDREC [illegible] form [illegible]

research [illegible] in the participa[illegible]

7 **Use of the word anonymous**
It a study is an [illegible] it possible to link [illegible] obtained for her/him cannot have degrees of anonymity: it is an absolute: a study either is or is not anonymous. Even if the data is anonymised later the study as a whole cannot be called anonymous.

8 **Named investigators**
Brief CVs should be submitted for investigators named on the application form all of whom must have approved the protocol.

9 **Adjust the Participant Information Sheet and Consent Form to your protocol**
The proforma given in the Application Form may need modification to suit your protocol. For example: in the case of an interview study do not seek consent for a physical examination by a medical officer. If interviews are to be recorded consent must be obtained and it must be made clear to the participant that (s)he can review the tape and withdraw it if (s)he so chooses. Do not use the word experiment if study or research would be more appropriate.

10 **Delays**
The MoDREC Application Form Guide should be referred to when completing the application form so that progress is not delayed as a result of incomplete information being submitted. Ensure that the most recent versions of the Application Form and its Guide are used. Sufficient time should be allowed for the scientific and ethical review processes. If a protocol needs to be considered at a MoDREC meeting plan which meeting you are going to aim for. [illegible] are posted on the website. If your [illegible] is suitable to [illegible] committee [illegible] phase allow the chairman more than 24 hours.

11 **Independent Medical Officer (IMO)**
For those studies which require one the IMO has two roles: first, to supervise health and safety aspects of the planning and general execution of the work and second to act as medical practitioner to the research participants. The IMO must have appropriate experience and ability for the study in question and must approve the protocol before agreeing to act as IMO. In addition (s)he must be familiar with the Independent Medical Officer Guidance and comply with its requirements.

Conclusion

The work of reviewing MoD research protocols and dealing with the associated ethical problems is always interesting and varied. The objective of the SACs and MoDREC is to encourage worthwhile research and to help the researchers to achieve ethical approval. In giving ethical approval for a research protocol MoDREC has a responsibility for it and therefore must ensure that the science is good and that the risks and burden imposed on the participants are acceptable bearing in mind the potential benefits of the research.

Contact details

MoDREC website
www.science.mod.uk/ethics/ethics.htm: useful for general information, form download and most recent contact details
Secretariat telephone number 020 7218 2512
e mail: george.papadopoullos754@mod.uk
MoDREC(Gen) chairman: Dr Robert Linton
e mail: robert@loximton.org
telephone 020 8877 9329

Disclaimer

The responsibility for this article rests with the author.

[illegible] MD

General

Royal Naval Medical Branch – A Reflection – Continued

E C Birbeck

Following the publication of the last of my reflections I was pleasantly surprised and very pleased to be contacted by Medical Branch colleagues past and present who having read the article recalled their own [illegible] time in the branch. I also shared [illegible] until I wrote the article that I began to realise there appeared to be a book waiting in the wings but that will have to wait until [illegible] year or so.

During the early 1970's I continued as a Medical Assistant (MA) expanding my [illegible] knowledge in operating theatres and anaesthetics. One educational point [illegible] transfer to the 'Octalent' installed in C5 ward during a period of refurbishment in the main 'B' block theatres. This tented theatre was an ingenious affair, no more than a plastic liner that was held up by air pressure fed by a compressor. My height made it difficult for me as I rubbed my head on the ceiling in parts, even more so when the compressor iced up and the tent sagged on top of me.

All the theatre staff of the time will remember the long nights spent in the Sterile Services department, long after surgery finished, packing instruments and bowls, sitting sleepily on the window sill watching the sun rise over Portsmouth.

I remember the time when innovation entered the theatres. As duty operating theatre staff we were required to attend all Cardiac Arrests in the hospital. We had to drop all that we were doing, if safe to do so, and as a group rush to grab the rudimentary kit we required. This was the first crash team [illegible] to carry the bags of equipment [illegible] had been into Gosport and [illegible] purchased a second hand Silver Cross pram which was duly stripped and all the items required loaded into it. The pram stood waiting for use. When the [illegible] team grabbed the pram [illegible]. The big challenge was the Sick Officers' Block. This required a journey out and across the road to Building 80 and to find [illegible] to take you to the floor and ward [illegible] problem encountered [illegible] as far as being a well sprung pram [illegible] bounced out [illegible] those following to stop [illegible]. So this idea soon died.

Recalling such crash calls, the duty operating team was called and we set off in the dead of night to the required ward again sick officers block. Sleepily we ran down through B6[1] from our night cabin adjacent to B3 ward and down the back stairs emerging through the door adjacent to the then victualling office. Now strung out as a group in the dark we could hear a thump, crash and the sound of milk bottles rolling back and forth. On stopping and turning in the gloom we could see Ted Littlewood (POMA) doing a balancing act, arms and legs flying, balancing on top of rolling milk bottles. It was impossible to run on whilst laughing.

During the early seventies the first items of electronic patient support equipment were starting to appear. These were nothing like the advanced systems that are available today. Up until then the von Recklinghausen BP cuff a

1 Ward numbers have since changed as the hospital is now [illegible] from the new main gate i.e A B C etc and the old B block is now C block [illegible] confusing for a

BMW [illegible] as was [illegible] was not [illegible] on a single [illegible] [illegible] Hewlett Packard [illegible] [illegible] the pulse [illegible] followed by [illegible] ball piston [illegible] RAF produ[illegible] monitor sym[illegible] throughout [illegible]

At the sa[illegible] introduced to [illegible] Busu[illegible] the event [illegible] changed [illegible] we [illegible] supply [illegible]

One pro[illegible] [illegible] Consul[illegible] spinal [illegible] anaesthetic. The [illegible] was undertaken [illegible] the floor. No ordinary [illegible] fashioned horse [illegible] a cupboard for [illegible] was brought to [illegible] cases [illegible] for the MUA [illegible] wheeled [illegible] [illegible] trolley and then [illegible] Heart [illegible]

and [illegible] even [illegible] the patient. On this occasion the patient was much larger than BVJ [illegible] and short in stature) and [illegible] unconscious patient [illegible] collapsed on top of him pinning [illegible] John Haughton turned [illegible] down beside BVJ and started to bang [illegible] shouting "A one, a two" as if a [illegible] refereee. BVJ peeled out from under the patient's arm pit saying "That's not funny John". The remaining staff present collapsed in [illegible] of laughter.

Permit me to recall a few more funnies from this era. Saturday's duty staff deep sea'd [illegible] in theatres placing theatre green towels under the doors along the corridor. Once the [illegible] were flooded we played a version of [illegible] hockey with brooms and pusser's soap. I also recall the day when the visiting plastic surgeon was undertaking a nasal operation and sister Nancy Tynan turned to Eddie Harrison [illegible] asked for sterile ice. "Err pardon sister?" [illegible] her Irish brogue repeated "Sterile ice". In return Eddie wheeled in a bowl of [illegible] water. "What's this chief I asked for [illegible]" "Well it was before it went into the [illegible]" was the reply. Nancy loved her [illegible] boys and we always had strawberries [illegible] delivered to theatres on the day of the [illegible] PRNS Tennis Rose Bowl tournament.

[illegible] the staff were actually progressing [illegible] commissioned save for myself who [illegible] as a three badge MA. One of our fold [illegible] officer training and returned one [illegible] some months later to the theatre for [illegible] his Sub Lt ring for all to see. A fresh [illegible] placed before him. "What no [illegible] rebuked!" A swift reply came from [illegible] of the coffee room. "Don't know about you but I drink from the cup." He duly left and [illegible] saw him again, well not in theatres. [illegible] for many of today's medical branch staff [illegible] realise that theatre staff of my era not only [illegible] with patients but prep shaved the patient the evening before becoming a deft

[illegible] the Cork Kearns [illegible]

[illegible] the demise of Haslar

hand with a cut throat razor. We applied plasters, packed CSSD, maintained and mended equipment and physically cleaned and autoclaved sets of instruments in large autoclaves within the theatres. One abiding memory is that we were nearly always called to be first and second assistant to many a [illegible] and reputable naval surgeon, spending hours at the table and at times with boots full of various bodily fluids.

By 1974 I had been drafted to Gibraltar at the time a busy Naval Hospital with [illegible] two operating theatres and the staff to [illegible] them. The theatres then had one of the most commanding views of any hospital – that of looking directly out over the Straits of Gibraltar. For the first few weeks you had 'new boy syndrome' and could be found staring out of the window at the splendid view. On one occasion a RNR Surgeon arrived who was a ship spotter. Prior to surgery he placed a telescope on a tripod and requested to be informed when SS Nonsuch went past in order to tick it off in his Lloyds Register.

Theatres were busy and I found myself getting well into my stride running anaesthetic rooms and operating lists, including maternity cases. The technology associated with anaesthetics had come forward by leaps and bounds from my days at Mtarfa and we were now able to cope with neonates and even return them to the UK for ongoing treatment. It was a testing time in that post delivery cannulation of the umbilical cord was not easy. Scalp vein sets were used. The baby was placed in a heated plastic domed egg for transfer. With no neonatal ventilator available I was the anaesthetist who hand ventilated the baby with a Jackson Rees circuit on the flight from Gibraltar to London. One anaesthetist Surgeon Commander David Lammiman had his lunch cut up for him by the stewardesses as he continued to hand ventilate the baby.

On another occasion the anaesthetist from St Bernards, the Gibraltar local hospital, went AWOL from the Rock leaving the hospital in a quandary. I soon found myself being collected by staff car and driven along with David Lammiman to the hospital. For many weeks we undertook morning theatre lists, but not [illegible]

out? On [illegible] days with ENT lists the ward maid [illegible] would stand at the door at lunch time and ask "who's for soup?"

Friday morning lists were fun times especially when the then Surgeon Lieutenant Commander Peter Butt used to undertake [illegible] using an Emo vaporizer which I [illegible] still in use in some third world [illegible] when Patients wriggled we [illegible] my wife always knew [illegible] had been doing when I arrived home [illegible] Phew you stink of Ether! It [illegible] gave you a headache. I know that [illegible] we also drove home [illegible] as well.

Surgeon Lieutenant Commander David [illegible] accomplished flautist, piano [illegible] and anaesthetist. Imagine today an [illegible] playing a flute to children as part [illegible] induction prior to having their tonsils removed. One day I made a flute like assembly from Heidbrink valves (part of a [illegible] circuit) and to my surprise he even got [illegible] out of that! It was a team of lads from [illegible] who helped moved his grand piano out [illegible] Crescent flat in Alverstoke. Now that [illegible] experience!

On one ENT list we had intubated the [illegible] but the bag was rigid and could not be [illegible] so the tube was instantly removed [illegible] open the red rubber tube there [illegible] halfway down the tube [illegible] the blockage.

[illegible] in 1977 thanks to the [illegible] of pharmacy colleagues in [illegible] me through my exams. In [illegible] selected to form a surgical support [illegible] RFA Fort Grange in support of FOF2 World Deployment. This for me was an ideal opportunity to equip and work onboard a new RFA whilst providing medical care for the whole deployment of 10 ships.

Working from scratch a full operating medical/surgical facility was provided with Surgeon Captain Mike Mann as Anaesthetist onboard HMS Norfolk and the Surgeon Surgeon Commander Phil Jones onboard HMS

Arrow. We were to come together for any surgical requirement. This included dealing with a strangulated hernia in the Indian Ocean in a howling typhoon. Not much fun having to assist with one foot on the table and the other against the sink for balance, the anaesthetic machine lashed to the bulkhead with all collapsing around you. Another case involved the transfer of a perforated ulcer from RFA Olmeda to Norfolk Island. We then borrowed a mini moke for a frightening tour of the island in our flying gear.

The 12 bedded ward was always busy but having no support this became difficult to manage as this was no PCRF which was still years away! Many RFA officers wives were onboard accompanying their husbands on the deployment including Gilly Mann an ex QARNNS. They formed a nursing watch from volunteers, of which there were many who cared willingly for all the patients. It made for an interesting time of it all. During the 11 month deployment I learnt much from Helo Transfers to other ships including an Indian merchantman which was a difficult transfer and retrieval of the patient to standing by a pilgrim ship in the Red Sea. The most memorable was being 'T' bagged by 846 from a Sea King in the wake of Fort Grange as a payback for managing to inoculate most of the flight one morning by attending shareholders meeting held daily in the hanger crew room and locking the door. Having approached the Grange with me winched down by some twenty feet the cab went into the hover and all the ships crew appeared on the upper deck. I later found out that a pipe had been made 'That the Doc was to walk on water!' I did not quite manage to scramble up the winch wire whilst being immersed in the ships wake up to my neck!

The next episode, the 1980s, will include a busy return to Gibraltar, a pier head jump to a ship in a non operating theatre role, managing the new operating theatres at Haslar, associating with the gentlemen of Hereford and the world of NATO, managing a medical facility with multinational staff and patients.

[illegible] C B [illegible] MBE MVO

J Royal Naval Medical Service 2008 Vol 94 1 51 52

General

The Falklands Conflict

D Wright

Reading the recollections of former colleagues who served in the Falklands conflict in 1982 (JRNMS 93 2 2007) brought back many memories. I was the medical appointer based in First Avenue House, High Holborn on Friday April 2nd when it all began.

There had been plenty of noises in the media following the landing of Argentinians in South Georgia and we knew that there was great activity in MOD Main Building but nobody had actually advised the Medical Director General (Navy) that hostilities were imminent. Many of us worked long hours in MOD but had some compensation by leaving early on a Friday afternoon. This Friday was no different except that some of us felt uneasy. The Deputy MDG(N) lived in Cornwall and he and I agreed that I would remain in the office until he was at home and could take over as out-of-hours contact. The telephone rang shortly after 5 pm and I assumed it was he. Instead it was an irate duty officer from MOD wanting to know why I was not at the meeting in the War Room. I chose not to debate the reasons, put in quick calls to Cornwall and to my wife and bicycled down to Whitehall. I found myself in the bowels of Main Building for the next 10 hours or so, a witness to the preparations for war with occasional involvement over the medical input required.

The first question put directly to me concerned the number of hospital ships at our disposal. I suspect they were testing whether I was still awake. At about 2 am I found myself ensconced with 2 directors from P & O looking at the designs of various ships including the longitudinal sections then common in advertisements in the colour supplements! The hospital ship saga was resolved later as described by Roger Leicester and Andrew Rintoul.

I [illegible] next day and there [illegible] of telephone calls. The [illegible] somewhat different [illegible] slept in the office for [illegible] team gathered in First A[illegible] with the many issues c[illegible] supplies for a major conflict [illegible] miles away. A duty MO [illegible] most of the period [illegible]

A MOD officer [illegible] owner [illegible] the world [illegible] ships were commandeered [illegible] From Trade or STUFT [illegible] phrase. As no [illegible] operate under civil [illegible] requirement that a [illegible] on board if [illegible] of 39 crew [illegible] passengers. I rapidly [illegible] that I could obtain no assistance [illegible] army and RAF colleagues for [illegible] demand. There [illegible] would be easier to have a requirement for a squadron (complete with MO) [illegible] MO. This was [illegible] rather than [illegible] STUFT [illegible] or RAF [illegible] were RN. We were unable to send Reserve MOs [illegible] holes which [illegible] officers [illegible]

During the next [illegible] RN [illegible] serving MOs. It [illegible] career [illegible] Training prog[illegible] agreements pregnant wives [illegible] and all the usual excuses [illegible] difficult vanished [illegible] about 1400 on one Friday afternoon [illegible]

Wright Royal Navy (Retired)

appearances made a significant impact at home at a time when it was touch and go as to whether the battle would be won

When it was all over and after those heady days when the returning ships were given such a jubilant welcome in Portsmouth I found myself at a big BMA meeting at the Festival Hall where Prince Charles was being installed as President He spoke eloquently at his presidential address for some 20 minutes – at least half of which he devoted to praising the efforts of the Medical Services during the recent conflict As the only serving MO in a crowd of some 2000 I pushed my way down to the front and suggested that it might be appropriate for me to meet the Prince given the content of his speech I was assured this was impossible as everything was planned to the last minute – but a message was sent to the Secretary and I was asked to stick around My wife and I were then summoned forward (with a hissed no more than one minute) Prince Charles had other ideas and wanted to talk about the conflict and his friend Rick Jolly for a good 10 minutes

It seems a long time ago now but those were desperate days We all had good friends who were closely involved and in great danger The RN Medical Service and the QARNNS did a wonderful job in a wide variety of ships and ashore If the conflict had lasted much longer there would have been no possibility of the roulement which was being discussed sending more staff south to relieve those who were there There were simply not enough to send It was a triumph for the branch – and should not be forgotten

Book Review

Nelson's Surgeon
William Beatty, Naval Medicine and the Battle of Trafalgar

Oxford University Press 2005
ISBN 0-19-928742-2 978-0-19-928742-0

Laurence Brockliss, John Cardwell and Michael Moss

The Bicentennial of the Battle of Trafalgar and the death of Nelson produced the predictable plethora of books on the subject. Most attempted to find a new angle on the familiar storylines of the battle itself and the great leader. A few were readable, most were ponderous, but very few shed any new light on the subject. This admirable slim volume is one of the few to explore a completely new subject. The three academic historian authors chose one of the main players from the now famous tableau of the Death of Nelson. This is the first and therefore definitive narrative of the life and times of Sir William Beatty, Nelson's surgeon.

Despite William Beatty's busy, long and productive life as a naval surgeon, very little is written about him and he chose to record very little himself. Most would regard this lack of source material as a major handicap in the compilation of a successful biography. Instead, by the application of exhaustive research in breadth and depth they have been able to assemble the pieces of the jigsaw to paint the picture of a decent, dedicated professional man with the wit to capitalise on the stroke of fortune of 'being in the right place at the right time'. Having attended Lord Nelson in life and in death he was well placed to write the definitive account of the death of Nelson, thus cementing his fame and his rightful place in the pantheon of characters at one of the most exciting times of recent history.

Many biographies follow a dull chronology of lives of interesting people; this one does not. The trusts of such in-depth research empower of the authors to paint a vivid picture of the professional environment into which the aspiring young naval surgeon placed himself. The book opens with an account of the evolution of the medical and surgical professions, from unregulated apprenticeship to a professional body. War has always been one of the great drivers in medical reform, both professionally and organisationally. The era of the French and Napoleonic Wars coincided with the professionalisation of medicine and the recognition that the art of surgery and apothecary had a major part to play in the modern profession of its day. Military surgeons, both Navy and Army, were employed and developed in one of the best regulated medical systems in the civilised world. Our hero found himself in the ideal circumstances through hard work, charm, wit and charm, plus occasional good fortune to rise to the top of his profession.

Most naval medics will be interested in the account of the training and education of aspiring young naval surgeons of that era although would be less than happy with the rates of pay of 10 shillings (50p) per day from which they were expected to provide most of their instruments and medications. Physicians were, of course, paid a little more at one guinea per day but were few in number and rarely went to sea. During this account of the

develop[illegible]
[illegible]
Se[illegible]
[illegible]

For [illegible] they give an excellen[illegible] lifestyle pr vations and [illegible]ks to health that the Nelsonian sailor could expect to face. The ships' surgeons although only afforded the status of a Warrant Officer worked hard and were highly valued by their commanding officers with whom they shared a special relationship. By the time Beatty first met Admiral Nelson he was still a young man (33) who had worked his way through the system serving in nine ships from the Caribbean to the eastern Mediterranean taking part in numerous types of action having faced medical challenges from battle injury to epidemics of yellow fever. He had been acquitted at an unjust court martial on a charge of disrespect.

In an era of patronage the professional fate of a naval surgeon was often inextricably linked to the fame and fortune of his seniors. Beatty's association with the famous admiral and his continued good relations with Emma Hamilton sealed his future.

Such was the importance and frenzy of excitement over the victory in the Battle of Trafalgar that many correspondents often very peripheral to the events aboard HMS Victory published snippets and scuttlebutt about the death of Nelson. Beatty's masterstroke was to write and publish the "Authentic Narrative" of the death of Nelson.

Beatty's later career culminated in his appointment as the physician to Greenwich Hospital and subsequent knighthood. Although he never accomplished any great medical breakthrough, scientific advance or significant organisational change he achieved high rank and great respect. He had worked hard, done his duty and acquitted himself well when the time came.

Many of us have an interest in historical matter and feel that perhaps we should have a book in us. This highly professional, thorough, definitive book shows how it can and should be done. The bibliography itself runs 11 pages and there are extensive thorough footnotes throughout the 200 pages of clear text and a comprehensive index. Anyone wishing to undertake further research in any medical (or naval) subject from this era would do well to give some attention to the bibliography. On the subject of the history of the Royal Naval Medical Service, this book qualifies as a BR. However, despite the intensely subject rich text, it is an easy and enjoyable read, with resonances for any naval medic.

Surgeon Captain James Campbell Royal Navy

Service News

Honours, Awards and Citations

Fellowship ad eundem of the Royal College of Surgeons of England

Surgeon Captain Alasdair J Walker OBE FRCS Royal Navy

Academic Achievements

Surgeon Captain P Buxton Royal Navy
MA (with distinction) in Archaeology

Surgeon Commander Nicholas Yarnall Royal Navy
Diploma in Aviation Medicine

Surgeon Commander J M Clarke Royal Navy
MFOM

Surgeon Lieutenant Commander L Whybourn Royal Navy
MFOM

Surgeon Lieutenant Commander J J Matthews Royal Navy
FRCS (Trauma & Ortho)

Surgeon Lieutenant Commander V J Price Royal Navy
MRCGP

Surgeon Lieutenant Commander S J Mercer Royal Navy
FRCS (General Surgery)

Surgeon Lieutenant D Henning Royal Navy
MCEM (Membership of College of Emergency Medicine)

Promotion

Surgeon Commodore L J Jarvis to be promoted Surgeon Rear Admiral and to be Assistant Chief of Defence Staff (Health) with effect from June 2008

Lieutenant to Acting Lieutenant Commander

Acting Lieutenant Commander V Milburn Royal Navy

Acting Lieutenant Commander [illegible] Royal Navy

Acting Lieutenant Commander [illegible] Royal Navy

Acting Lieutenant Commander [illegible] Royal Navy

Lieutenant to Lieutenant Commander

Lieutenant D Edwards Royal Navy
Lieutenant P G Green Royal Navy

QARNNS

Lieutenant to Acting Lieutenant Commander

Acting Lieutenant Commander E Watson

Lieutenant to Lieutenant Commander

Lieutenant S L Gardner Clark
Lieutenant J E D Ouvry
Lieutenant P J Selwood

Transfer of Commissions

To Career Commission
Medical Services

Lieutenant D Edwards Royal Navy
Lieutenant D A Pickering Royal Navy
Lieutenant N O Vines Royal Navy

To Medium Commission
Medical

Surgeon Lieutenant S G Gokhale Royal Navy
Surgeon Lieutenant D C W Henning Royal Navy
Surgeon Lieutenant E J Hulse Royal Navy
Surgeon Lieutenant A L Jones Royal Navy
Surgeon Lieutenant G T MacFarlane Royal Navy
Surgeon Lieutenant D M McMenamin Royal Navy

Surgeon Lieutenant L Mayers Royal Navy
Surgeon Lieutenant J Newton Royal Navy
Surgeon Lieutenant W O'Shea Royal Navy
Surgeon Lieutenant J Penn Barwell Royal Navy
Surgeon Lieutenant S Roue Royal Navy
Surgeon Lieutenant A J Shearman Royal Navy
Surgeon Lieutenant A J Wrigley Royal Navy

Dental

Surgeon Lieutenant (D) L K Falla Royal Navy

QARNNS

Lieutenant A M Claridge
Lieutenant G R Clark
Lieutenant S A Fraser Smith
Lieutenant F A Kelly ARRC
Lieutenant M I Wesson
Lieutenant A E M Wright Jones

To Full Commission
QARNNS

Lieutenant S C France
Lieutenant S L Gardner Clark

To Medium Commission
Medical

Surgeon Lieutenant Commander A J Calvin Royal Navy
Surgeon Commander A D K Campbell Royal Navy
Surgeon Lieutenant Commander A M Edward Royal Navy
Surgeon Lieutenant Commander A E Gregory Royal Navy
Surgeon Commander K J Haworth Royal Navy
Surgeon Lieutenant Commander R Hemingway Royal Navy
Surgeon Lieutenant Commander J D P Hudson Royal Navy
Surgeon Lieutenant Commander B M Pointon Royal Navy
Surgeon Lieutenant Commander M J Turner Royal Navy
Surgeon Lieutenant Commander A J Vale Royal Navy

Dental

Surgeon Lieutenant Commander (D) G J Kemp Royal Navy

To Full Term Commission
Medical Services

Lieutenant Commander J L Davies Royal Navy

Medical

Surgeon Commander R M Bateman Royal Navy
Surgeon Commander S A Bland Royal Navy
Surgeon Lieutenant Commander A Brown Royal Navy
Surgeon Lieutenant Commander S M Collett Royal Navy
Acting Surgeon Commander J L Denholm Royal Navy
Surgeon Lieutenant Commander N D H Imm Royal Navy
Surgeon Commander S J Leigh-Smith Royal Navy
Surgeon Lieutenant Commander K R E Prior Royal Navy
Surgeon Commander B R C Siggers Royal Navy
Surgeon Commander L M Thomas Royal Navy
Surgeon Lieutenant Commander L A Whybourn Royal Navy

Dental

Surgeon Lieutenant Commander (D) G E Bryce Royal Navy

QARNNS

Lt Cdr R L Newby Stubbs

Obituary

Commander John Dalgleish MBE (1951 – 2007)

It is with deep regret that we report the death of John Dalgleish who died suddenly on 9th September 2007 whilst walking the Pennine Way. He was 55 years old.

John was born and brought up in Leeds, Yorkshire. He was the oldest of 5 children. He attended Leeds High School but left with no formal qualifications in 1968 (his academic career was to blossom later in life). Following school he worked in a chemical laboratory for one year and this inspired him to seek a career in the medical field. Luckily for us he decided to do this within the Royal Naval Medical Service.

John commenced his Service career as an aspiring Sick Berth Attendant. His abilities were quickly recognised and over the next 8 years he worked in a variety of ships and shore establishments, gaining promotion to attain Chief Petty Officer status in 1977.

In 1979 he was selected for a commission and attended Britannia Royal Naval College Dartmouth. During his time there he was awarded the Colley Sword for Excellence but nobody ever asked for it back and so John was the custodian until he retired from the RN in 1997. At this point he felt he should hand it back.

After passing out at Dartmouth, John undertook a variety of general duty appointments but he quickly decided he would like to work within the Submarine Service, specialising in the field of Radiation Protection. Thus began John's academic career. Over the next few years he gained his professional qualifications: a Bachelor of Arts degree via the Open University in 1985 and a Masters of Science Degree with distinction from Newcastle University in 1989. Not being content with this, in 1995 John went on to gain a Doctorate of Philosophy from University of Newcastle upon Tyne's Faculty of Medicine. The PHD title was "The effects [illegible]

[illegible] We [illegible] that he [illegible] Service [illegible] first [illegible] Director [illegible] the field [illegible] Services Office [illegible] John [illegible] He [illegible] his forthright personality [illegible] touch of devilment [illegible] for good items [illegible] was perfect for [illegible] this. He was much respected by his peers, superiors and in 1992, whilst working in Devonport Naval Base, he was awarded the MBE for his innovative work on radiation dose management.

In 1995 John was appointed to the premier Medical Services post in radiological protection undertaking the responsibilities of the Assistant Chairman of the Ministry of Defence's Naval Nuclear Regulatory Panel. In a period of 20 years John had worked his way up the professional ladder from Sick Berth Attendant to a position of great responsibility, a remarkable achievement.

Whilst working for the Naval Nuclear Regulatory Panel John had to consider his future. This was the pinnacle of his radiological career in the Royal Navy and further appointments would take him back into mainstream Medical Services work. Accordingly in 1999 he decided to retire and pursue his Radiological Protection career within the civilian sector. His talents were instantly snapped up by the DERA (now the Defence Science and Technology Laboratory (Dstl)) based at the Institute of Naval Medicine, where he was employed as a Principal Health Physicist. At the time of his

sudden death he was a [illegible] people
Group Leader managing a team [illegible]
Radiation Protection Advisors and [illegible]
physicists

John was made a Fellow of the [illegible]
Physicists in 2004. He was also a [illegible] of
Society of Radiological Protection [illegible]
served as a member of the Editorial Board [illegible]
the Journal of Radiological Protection.

[illegible] John was anything but a [illegible]
[illegible] career he wrote and directed many [illegible]
[illegible] pantomimes and often played [illegible]
act dame. He managed to win the [illegible]
Best Player on 3 consecutive years.

[illegible] and Mike Dea

[illegible] was [illegible]
[illegible] Naval
[illegible] Grant,
[illegible] now
[illegible] his career
[illegible] for the
Royal [illegible] a wonderful
[illegible] with hard
[illegible]. He is sadly
[illegible] will be forgotten in the
[illegible] his family, friends and colleagues

[illegible] has been [illegible] of the death of the following

Surgeon Captain F A F MacKenzie Royal Navy (Rtd)

Commander I Coulton Royal Navy

The editor would welcome any words in memory of them

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[illegible] and the authors are explicit ... subject ... his or her informed written ... A copy of the letter of approval issued by the ethics committee must be provided.

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The title page should contain a concise informative title, up to five key words, the names and initials of all authors and their appointments and the department(s)/institution(s)/ship(s)/establishment(s) where the work was carried out.

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Tables and illustrations (figures) should add to the paper rather than only repeating information presented in the text. Each table and illustration should be on an individual page separate from the text, be numbered in two distinct sequences in the order in which they are mentioned in the text, and have an explanatory caption (typed on a separate sheet for illustrations).

News photographs of academic, social, sport or other occasions involving members of the Royal Naval Medical Service are welcomed.

Normally printed illustrations will be monochrome. The views of the Editor should be sought where colour illustration is thought to be essential or highly desirable. Photographs must be of good quality glossy unmounted and be provided in camera ready form with redundant areas trimmed off. The figure number, author's name and top/bottom should be marked on the back. Line drawings should be professionally drawn and labelled or of equivalent standard and submitted as photographic prints or high quality photocopies. Lettering and numbering should be sufficiently large to ensure legibility after reduction for publication. Freehand lettering is not acceptable.

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Measurements should be given in the units in which they were made but, with the exception of blood pressure in mmHg and haemoglobin concentration in g/dl, non-metric units must be accompanied by metric (SI) equivalents. The approved name of drugs should be used (proprietary names may follow in parentheses). If an abbreviation is used, the term for which it stands should be given in full at its first mention in the text, e.g. Institute of Naval Medicine (INM).

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Responsibility for the accuracy and completeness of references lies with the author(s) and these will not be checked by editorial staff. Only essential references should be included and authors should verify them against the original documents. References are identified in the text by superscript Arabic numerals, and are numbered and listed consecutively at the end of the manuscript in the order in which they are first cited in the text. A full list of references should be given at the end of the paper using the form of reference adopted by Index Medicus. Papers accepted but not yet published should be included in the references followed by '(in press)'. Those in preparation (including any submitted for publication), personal communications and unpublished observations should be referred to as such in the text only.

Acknowledgements

The assistance of those who are not authors but made substantial contributions to the study and/or preparation of the paper should be acknowledged as should the source(s) of grant support, equipment, drugs, facilities etc.

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Contents

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Editorial

This edition focuses on a short series of papers from RN Medical staff and oth supporting Operation Telic 11 in BMH Basra. The first describes the application o date management of severe haemorrhage in an Iraqi soldier with an abdominal g wound. The second provides a vivid insight into the management of a unit as t casualties and how they and existing patients are managed to ensure the unit ren effective as possible and uses its staff to best effect. It covers a point of view that rarely otherwise get to hear about yet involves considerable skill and expertise to get right and contributes as much to patient outcomes as the individual clinical skills medical staff. The third paper also looks at the activities of the BMH but from a n more personal view point and in its own way describes a small team from MDHU Derriford as it metamorphoses from innocence and perhaps apprehension into a n and operationally experienced group which did not find itself wanting when put to test. The arrival of this paper in the Editorial Office is timely as a significant proportion the Royal Naval Medical Service prepares for Operation Herrick 9 and its support t Brigade in Afghanistan. I am sure many people will share similar doubts and express similar apprehensions as they prepare to deploy and anticipate sharing similar experiences.

The size of the Herrick 9 deployment and its likely impact on the home service l to the year resulted in the change of date of the Blood Red Dinner from September to to allow more people to attend. As usual the Journal is pleased to reproduce both the Medical Director General's speech and that of the principal guest, Major General Rose. I am assured that all will be back to normal next year for the Centenary Dinner of the Royal Naval Medical Club at the former Naval College in Greenwich.

This edition also carries a review of the Tri Service Anaesthetic Apparatus (TSA) outlining its development and use over many years and in many campaigns. It has demonstrated enduring utility as a piece of military medical equipment and has also proved to be flexible and adaptable in that newer anaesthetic agents may be used as others are superseded. The paper itself earned the author the Abbott History Prize awarded by the Association of Anaesthetists of Great Britain and Ireland, with whose permission it is reprinted. It is always a pleasure to highlight a naval medical success story and all the more so when that success has been earned by a traditional and recognised at national level – well done!

This Editorial and this edition of the Journal will be my last as I move on from the Institute of Naval Medicine towards retirement. I have come to realise that the Journal has been a remarkably interesting read over the years since the first edition in 1915. It has also been kind enough to publish some of my own work. One of the benefits of being the Editor is the ability to walk across the office to the bookcase and select any of the previous 93 Volumes and guarantee to find among their pages a rich seam of material which invariably illustrates the breadth of interest of our colleagues. I hope that in some way my own contribution to the Journal has maintained that diversity of contents for the two volumes for which I have been Editor. I am delighted to pass on the mantle to Surgeon Captain David Brown and wish him and the Journal every success for the future.

J Royal Naval Medical Service 2008 94.2 68–70

Clinical

Massive haemorrhage following penetrating abdominal trauma

J A Read, M Ingram

Introduction

Within the current operational theatres of Iraq and Afghanistan UK forces have witnessed an evolution in injury patterns seen in major trauma. High energy penetrating trauma and blast injuries secondary to improvised explosive devices (IED) are increasingly prevalent. Experience in the management of patients with ballistic injuries has led to significant developments in the area of military trauma with medical advances introduced at all stages from the point of wounding through to definitive surgical care. Improvements in the delivery of care to the seriously injured trauma casualty has had a significant impact in survivability from battlefield injury [1] and placed military healthcare at the forefront of the development of trauma management.

In 2007 the Surgeon General published an Operational Policy Letter (SGPL 10/07) [2] for the management of massive haemorrhage operations [2]. This document is based on current best practice and instruction which originates from recent experiences in Iraq [3]. Current UK military guidelines [3] have a heavy reliance on laboratory results. Experience has shown that these are not transferable to the battlefield environment due to the extent of delay from current ballistic trauma to platelets and the time limits of laboratory testing. The other critical issue is significant mortality associated with massive haemorrhage in the pre-hospital and emphasises the importance of fluid resuscitation avoiding significant dilution of red cells and coagulation factors whilst maintaining core temperature. The lethal triad of acidosis, coagulopathy and hypothermia will quickly develop without early aggressive and focused treatment. The recommendations are for early replacement of warmed red cells and clotting products, maintaining an adequate platelet count, fibrinogen and serum calcium level and the use of recombinant activated Factor VII to maintain haemostasis in appropriate cases.

In this article we demonstrate how the guidelines are applied in the operational setting by case review of the trauma management of an Iraqi soldier.

Case Summary

A 20 year old Iraqi soldier was brought to the British Role 2E facility in southern Iraq by the medical Immediate Response Team (IRT) having sustained a gun-shot wound (GSW) to his abdomen. Hypovolaemic shock was diagnosed at primary survey and a shock pack requested [4 units of red cell concentrate and 4 units fresh frozen plasma]. Injuries were identified as an entry wound in the left hypochondrium and exit wound in the lumbar paravertebral area. A FAST scan (focussed abdominal sonography in trauma) confirmed the presence of intra peritoneal free fluid. The patient, who was a transient responder to fluid resuscitation, was transferred to the operating theatre 26 minutes after arrival in the Emergency Department.

Operative findings of trauma laparotomy included free blood in the peritoneal cavity contused and perforated transverse colon a tear in the anterior spleen left sided retroperitoneal haematoma large left perinephric haematoma and a small tear in the posterior aorta at the level of the left renal vein

Damage control surgery was performed involving bowel resection with formation of end colostomy and mucous fistula vascular repair and ligation of the left renal vessels The abdomen was packed and left open as a laparostomy Throughout the operative period there was ongoing haemorrhage requiring continuous fluid resuscitation One short but significant period of bleeding was associated with a period of cardiovascular instability Fluid resuscitation involved rapid infusion of red cell concentrate (RCC) and fresh frozen plasma (FFP) in accordance with the guidance laid down in SGPL 10/07 RCC and FFP were infused with a target 1 1 ratio with recombinant factor VIIa administered after the first 8 units RBC and platelets and cryoprecipitate administered following transfusion of 1 1 5 times blood volume During the peri-operative period the patient received in total 20 units of RCC 15 units FFP 1 pool of platelets 2 doses of cryoprecipitate (2x5 units) a single dose of Factor VIIa (100mcg/kg) as well as 5 litres of crystalloid / colloid Rate of infusion of these fluids was guided by physiological parameters laboratory results arterial blood gas analysis and the clinical feedback from the surgeon By following the guidance of the SGPL 10/07 despite large fluid shifts and associated inflammatory response the patient never developed the lethal triad previously described the last analysis in theatre before being transferred to ITU showed a near normal pH core temperature and coagulation state as shown in Table 1

Temperature	3 4
PH	7 10
Base Excess	3
Haemoglobin	10 8
Platelets	90
INR	1 1
Fibrinogen	1 5

Table 1 Laboratory results [illegible]

The patient spent the next 48 hours ITU sedated and ventilated During this period he received a further 5xRCC 2xFFP 1xPlatelets as guided by laboratory analysis An abdominal CT scan was performed which suggested that the retroperitoneal haematoma had not increased in size After 48 hours the patient returned to theatre for [illegible] laparotomy removal of packing and abdominal wall which passively closed The patient returned to ITU sedated and ventilated in a stable condition [illegible] to slowly wake and extubate when appropriate

Unfortunately prior to extubation the patient developed a sudden deterioration in gas exchange requiring escalating levels of oxygen and ventilatory support Despite maximal support the patient suffered a PEA (Pulseless Electrical Activity) cardiac arrest and even though initial resuscitation was successful the patient later died on the intensive care unit The cause of death was not confirmed due to the inaccessibility of post mortem autopsy on host national patients Given the history and time course of his deterioration pulmonary embolism was the most likely diagnosis as cause of death

Discussion

Despite the overall poor outcome there are many positive aspects from which we can learn in this case There is little doubt that peri operative management heavily influenced by the SGPL on massive haemorrhage was extremely effective in producing optimal physiological conditions perfusion of vital organs and haemostasis The patients parameters on transfer to ITU were as good as could have been expected given the nature of injuries sustained allowing him the best possible opportunity for recovery

[illegible]

The [illegible] factor [illegible] throm[illegible] and the [illegible] often [illegible] operative [illegible] packs may [illegible] Add[illegible] associated [illegible] thrombo[illegible] [illegible]

[illegible]

discussed and whilst there is a possibility it may have contributed to the development of the thromboembolism it was a key component of the management that produced an optimistic outlook in the first 72 hours. As with most of medicine decisions have to be made on a risk benefit analysis and outcomes are not always favourable.

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[illegible] *UK Med Group Op TELIC 11*

[illegible] *UK Med Group Op TELIC 11*

J Royal Naval Medical Service 2008 94 2 71–73

Clinical

A Very Unusual Case History

P J Fowler

Previous Medical History

Mrs MH is the 41 year old wife of a servicemen stationed in Cyprus. They had been living on the island for the previous four years. Prior to 2007 her only significant medical history was in connection with migraine and gynaecological problems, namely endometriosis, miscarriages and unsuccessful IVF.

During the early months of 2007 she presented on a number of occasions to several different GPs or locums with minor ailments and migraines as well as symptoms of heartburn and indigestion for which she was treated with antacids and subsequently Omeprazole. An H pylori test was negative.

Presenting complaint

On 27 August she presented with epigastric and retrosternal chest pain associated with nausea. She was prescribed more Omeprazole.

On 10 September she attended with signs of a rhinitis and sinusitis for which she was prescribed Doxycyline and Loratidine.

The following day she re-presented with epigastric/chest pain. Clinical examination was normal as was an ECG. Blood results were: Hb 13.0, WCC 9.9 with normal differential. Amylase/U&Es normal, while LFTs were borderline raised. She was advised to continue the Omeprazole although gall bladder disease was mooted.

On 17 September she presented again with worsening coryza but now also had a generalised arthralgia. She was prescribed a [illegible] and paracetamol.

On 18 September she developed further epigastric pain and was advised to continue Omeprazole. An abdominal ultrasound scan (USS) was ordered.

On 21 September she was seen by me for the first time with quite severe myalgia and arthralgia and a dry cough. She was pyrexial (37.3 C) but her chest was clinically clear. I prescribed Ibuprofen and arranged to review her after that weekend.

By 24 September she was feeling extremely unwell; her myalgia had worsened and she had had some haemoptyses associated with her dry cough over that weekend. Admission was arranged immediately to TPMH Akrotiri to see the duty Consultant Physician. A chest X-ray was taken on arrival.

The CXRs showed patchy right mid zone changes and based on her ongoing pyrexia and haemoptysis she was started on IV Cefuroxime for a presumed pneumonia. Incidentally an abdominal USS confirmed the presence of gallbladder disease. Over the next three days her condition deteriorated and she had further frank haemoptyses. Repeat CXRs showed extensive right lung consolidation to the point of a white out. Her Hb had dropped to 7.6 and her CRP increased to >200.

Post blood transfusion she was medevaced to RCDM Birmingham and admitted to Selly Oak Critical Care Unit. On arrival she had to be intubated and ventilated because of respiratory failure. Her antibiotics were changed to

Granulomatos haemorrhage but made (so called L of Wegener s Granulomat marised in the box. She underwe of plasma exchange and was subs mmenced on six cycles of Pulse IV phosphamide with Mesna cover

She was extubated on 9 hohol but required oxygen supple ment 17 October. During th s she had IV oglobulins. As she remained to perience some shortness of breath and chest pains a V/Q scan was taken which showed a defect consistent with previous vasculitic changes. On 25 October she was deemed fit to be transferred to the Edinburgh Royal Infirmary to continue her treatment and care there family. It is anticipated that she will remain on immunosuppressant medication for at least the next 2-3 years if not for life.

Wegener's Granulomatosis (WG)

- Disease now known as Wegener's Granulomatosis first described in 1954
- Incidence of WG is thought to be between 2-11 per million of the population per annum
- Granulomatous disease of unknown aetiology although an autoimmune condition
- A primary systemic vasculitides affecting predominantly small arteries
- Can occur at any age and appears to effect both sexes equally
- Can present as a decline in health over a year or more or develop within a matter of weeks
- Characteristically effects the upper respiratory tract lungs and kidneys
- Occasionally there may be involvement of the skin and nervous system
- Often starts with severe rhinorrhoea followed by a cough haemoptysis and pleuritic pain (NB above presenting symptoms)
- CXR usually shows multiple nodular masses or pneumonic infiltration with cavitation
- Kidneys often develop a necrotizing microvascular glomerulonephritis
- Condition responds well to Cyclophosphamide
- PR3-Anti Neutrophil Cytoplasmic Antibodies (ANCAs) present in 90% of serum from patients with Wegener's

Summary

The above case history demonstrates well how a severe potentially lethal medical condition can often develop quite insidiously with what appeared to be quite common and everyday symptoms initially.

In my opinion one of the porential problems with the management of this lady

was the number of different doctors she consulted within the practice both military and locum (11 in total during 2007) resulting in a lack of continuity of case. However it is impossible to ascertain quite when the vasculitis actually developed or whether it could have been suspected earlier.

In nearly 30 years as a doctor this is the first case of Wegener's that I have knowingly [illegible] Perhaps because of [illegible] is what makes being a GP [illegible] and challenging role [illegible] one you see someone with [illegible] dry cough [illegible]

References

[illegible] Kumar & Clark 5th Edition [illegible] website

Surgeon Commander P J Fowler MSc MBBS MRCS [illegible] FRCP [illegible] FFPM FRCP(Glas) MFFP Royal Navy

Senior Medical Officer EPISKOPI Garrison Cyprus

J Royal Naval Medical Service 2008 94.2 74-82

Clinical

Anaesthesia in the Armed Forces – A History of the Triservice Apparatus

S J Mercer

The basic design of what was to become the Triservice Apparatus (TSA) was first described in 1968 [1]. It consisted of two Oxford Miniature Vaporisers (OMV) placed in series leading to an Oxford Inflating Bellows, a length of corrugated tubing, expiratory valve and face mask. Air was used as a carrier gas, but it was noted that a T piece could be attached to the inlet port of one of the vaporisers to allow oxygen enrichment.

[illegible]

[illegible] anaesthetic [illegible] available [illegible] flying squad [illegible] a portable [illegible] designed that [illegible] allow the ad[illegible]on of [illegible] onal mode [illegible] most [illegible] s[illegible] from an operating [illegible] [2]. A one way [illegible] system was [illegible] at the time to [illegible] the most [illegible] to the [illegible] was independent of medical gas [illegible] concentrations of agents could be delivered [illegible] control was easily effected by ducting from the exit port of the one way valve.

Fig 2 The [illegible] anaesthetic [illegible] mounted on a base plate [illegible] reference [illegible]

The Triservice anaesthetic apparatus was formally described by Houghton [3] in 1981. It [illegible] two vaporisers which permitted the [illegible] of both halothane for hypnosis and trichloroethylene for analgesia and provided [illegible] anaesthetic techniques; these agents could be used either individually or together. The apparatus could be employed in a patient breathing spontaneously or undergoing manual ventilation and controlled ventilation was permitted by connecting to a ventilator. Although primarily a military development it was commented in the literature [4] that its principle of design could be extended to civilian practice *and it would permit the anaesthetist to carry the tools of his trade in a brief case as does his general practitioner colleague*.

The TSA did not rely on an electricity supply making it ideal for use in the field or remote locations, and the circuit had the capability to

allow oxygen supplementation.

Importantly for the military the equipment was modular so that the various components could be used or replaced independently. It was easier to transport and more robust than other equipment available and was very quickly adopted by the Defence Medical Service for use by deploying anaesthetists. At the time it was noted that *the striking advantage of the Triservice apparatus is its simplicity as there is no unwieldy pipe strewn Boyle's machine, the potential for mechanical and gas-pipe connection problems is reduced and the apparatus is fail-safe. There is no need for rows of gauges, flow meters or an oxygen failure device and during its use reliance on nitrous oxide can be forgotten* [4]. It was commented earlier that occasional anaesthetists could be easily taught to give a modern anaesthetic with a draw over type apparatus [2]. This would also be ideal for the military with anaesthetists deploying from an NHS civilian or peacetime setting to battlefield hospital conditions. The transport of heavy oxygen cylinders could be reduced to a minimum and in an emergency there was no danger of hypoxia from failure of the oxygen supply.

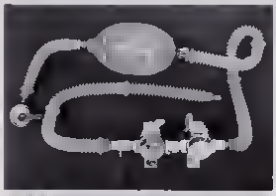


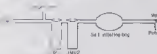
Fig. [illegible] The Triservice Apparatus

One of the key components of the TSA was the Triservice vaporiser that was painted a matt black colour to prevent light reflection in the battlefield. Developed from the OMV it held a volume of 50ml of volatile anaesthetic agent and, due to its construction of steel, had the potential to be used with any anaesthetic liquid without the risk of corrosion. The 50-ml reservoir was chosen for the Triservice apparatus (as opposed to the original 30ml) because it was found that the smaller OMV reservoir emptied too rapidly and thus required replenishing frequently. A folding stand was constructed of three plates attached to its base that swung out to provide a stable platform. The vaporiser contained *fortifed* ether (Freze) which was known to solidify at minus 40°C in the fluid reservoir and this acted not only as a heat store in the base of the vaporizer but also reduced the danger of mechanical distortion when used in colder climates. To favour usage in battlefield conditions the vaporiser was such that it could be permitted to tilt up to 60° without spilling its contents or altering the delivered concentration. The effects of high or low ambient temperatures on vapor per output were predicted by reference to the graphs published by Houghton with his initial description [3].

[illegible] The Triservice Vaporiser (Reference [3])

The TSA circuit which [illegible] were to be inspired by [illegible] drawn or blown over the [illegible] of the vaporiser with a rotameter determining the proportion of gas actively passing through the vaporizing chamber. The concentration of volatile could be altered by the anaesthetist moving a pointer registering against an engraved scale marked in degrees. The adaptability of this set up was such that there

war a [illegible] ranges [illegible] 0-4 5 [illegible] 10 I 5 [illegible] vasel [illegible] with the [illegible] [illegible] (4) which was [illegible] the battlefield



[illegible] positions taken

[illegible] was achievable by the [illegible] polyvinyl chloride [illegible] 6 or Mark 2 (Laerdal) which [illegible] by the National [illegible] approximately [illegible] thought to have a *good* [illegible] in pulmonary [illegible] to be assessed [illegible] It was accompanied by two transparent [illegible] face masks with inflatable face pads [illegible] and child The construction of this [illegible] allowed easy storage with the valve [illegible] and conical connectors being made of [illegible] green plastic and the actual valve flaps [illegible] cone rubber The option of adding an [illegible] adaptor to the rear of the bag was also [illegible] by Houghton This allowed oxygen [illegible] to a maximum of 35% and [illegible] extension tube was attached as a [illegible] up to 65% oxygen could be [illegible] The oxygen adaptor could be [illegible] replaced by an anti gas [illegible] so that the apparatus could [illegible] clear or chemically [illegible] environment The Oxford [illegible] a volume cycled flow [illegible] also modified for use with the [illegible] particularly useful as it had the [illegible] powered by a pneumatic motor using non [illegible] compressed gas Military engineers [illegible] the compressor used to [illegible] army trucks to power the [illegible] also run on compressed gases [illegible] from a pipeline Other [illegible] the Oxford Ventilator were [illegible] with both adults and [illegible] was detachable and autoclavable [illegible] electrically driven East Radcliffe [illegible] was also permitted to be used with the TSA

An initial concept in the design of the TSA was that it had to have the potential to be used in conditions where the supply of oxygen cylinders would be limited Oxygen supplementation was obviously important for general anaesthesia and as there was no commercially available system on the market a specially designed module *the Houtonox oxygen flow control device* was developed from the Novox resuscitator so that oxygen supplies could be preserved by having low flow rates of 1 or 4 litres per minute This regulator consisted of a single stage reducing valve combined with a flow regulator with an oxygen pin index fitting for the inlet The device was sturdy accurate and the flow rates were independent of the position of the regulator The TSA as a non-rebreathing system minimized bacterial contamination and avoided the problem of disinfection of a circle system

The first documented usage of the TSA by the military under field conditions was with a Field Surgical Team (FST) in the Dhofar province of Oman [5] Knight and Houghton had also used the equipment in a modern well equipped hospital in Northern Ireland prior to use in the field They described the TSA as a very versatile piece of equipment that allowed *the administration of oxygen by face mask and endotracheal tube (with and without controlled ventilation by hand or with a ventilator) the administration of preoperative analgesia for intra operative analgesia and anaesthesia and postoperative analgesia and its use in casualty evacuation* Knight and Houghton each employed slightly different techniques One preferred thiopentone as an induction agent and then moderate hyperventilation with halothane or

trichloroethylene and tubocurarine when needed. The other used Althesin for induction pancuronium as the non-depolarising muscle relaxant with manual ventilation in an air oxygen mixture. Supplemental intravenous fentanyl or phenoperidine was used to minimise the concentration of trichloroethylene administered [5].

Emergency casualty cases were assumed to have a full stomach and therefore following a period of 3 to 5 minutes pre-oxygenation and intravenous induction they were intubated *to protect the lungs from gastric contents*. Most were then ventilated mechanically. Satisfactory surgical anaesthesia was achieved in 3 to 5 minutes by slowly increasing the concentration of the volatile agent following induction with a maximum of 4.5% halothane being used. Providing there were no involuntary movements or pupil reactions to narrow the halothane was maintained at 0.5 1% or the trichloroethylene at between 0.5 0.75% for controlled respiration and 1.2% halothane for spontaneous respiration. It was also noted that intravenous analgesic supplementation with fentanyl (0.05-0.1 mg) or phenoperidine (0.5-2 mg) could allow the trichloroethylene to be reduced to 0.25-0.5%. The TSA was able to operate for about 4 hours before the 50ml vaporiser reservoir required refilling and with a flow of 1 litre per minute a small 300 litre oxygen cylinder was able to last up to 5 hours [5]. They noted that compared with controlled ventilation for a casualty breathing spontaneously a higher concentration of volatile agent was required in the initial period leading to stable anaesthesia. Compared with the original OMV the output of the Triservice vaporiser had been adapted to increase the maximum delivered trichloroethylene from 1% to 1.5% and from 3% to 4.5% for halothane. As experience progressed it was concluded that the use of halothane or trichloroethylene alone was not satisfactory for spontaneous respiration but a combination of the two produced an acceptable level of anaesthesia more smoothly and more rapidly. For maintenance of anaesthesia during controlled ventilation ether volatile agent alone proved suitable. A rapid recovery could also be achieved with the TSA and this was particularly important in a [illegible] setting as theatre or nursing personnel were freed up to undertake other duties. It allowed a greater throughput of cases in theatre at times of increased casualties.

In April 1982 Argentine invaded and took control of the Falkland Islands. The response of the Conservative government was to deploy a taskforce to reclaim the islands. Following the return to the UK both Royal Navy [6] and British Army [7] anaesthetists published their experiences particularly of how the TSA was employed and any problems they had encountered. About 800 general anaesthetics were performed over the whole campaign and 637 of these were by naval anaesthetists. The hospital ship SS UGANDA was a merchant cruise liner adapted in Gibraltar en route to the Falkland Islands. There were two anaesthetists onboard who had two models of Boyles machines, three Pneupac ventilators, two Penlon Oxford ventilators with air compressors and four TSAs at their disposal. The two aircraft carriers HMS HERMES and HMS INVINCIBLE had theatre facilities available onboard. Onboard HMS HERMES 16 general anaesthetics were performed for battle casualties following the Exocet attacks on HMS SHEFFIELD and HMS GLAMORGAN. General anaesthetics were given to 25 patients onboard HMS INVINCIBLE. These were mainly for Argentinian sailors from the trawler Narwal with shrapnel wounds. Fortunately there was never such a shortage of gases that TSA usage became mandatory. One Royal Naval surgical team disembarked with 3 Commando Brigade at San Carlos and together with the Army Field Surgical Team set up the field hospital at Ajax Bay. It was no surprise that anaesthesia ashore was carried out under particularly difficult and often hazardous conditions but the medical officers involved concluded that the TSA was very valuable as it was compact and easy to transport dispensed with the requirement for bulky anaesthetic equipment.

During the Falklands campaign the TSA was used for the first time under low ambient temperatures. It was also first occasion on

which in T[illegible] per ods [illegible] descr p[illegible] the o[illegible] a[illegible] [illegible] [illegible] [illegible] es o[illegible] [illegible] a be [illegible] Anaesther sts to un[illegible] both halothane and r[illegible] settings after about 20 m[illegible]n in order to mainta n the requ red level of anaesthesia *Control settings of up to 2 5% halothane and 1% trichloroethylene m xt ure were often needed dur ng spontaneous respiration anaesthesia n order to counter tachycardia tachypnoea limb movements and sweating* [8] Naval anaesthetists Bull and Tighe reported that *it became common practice to cuddle the vaporisers under our clothing to supply addit onal heat with apparent good effect It became evident that such additional heat was equ red to maintain a satisfactory level of anaesthes a* [8] Correspondence n Anaesthes a [illegible] the wa [9] discussed that temperature or pensat on had been thought about when concept of the TSA was in ts nfancy as t would cert n y have been poss ble to des gn a vaporse that ncorporated t n view of the [illegible] complex ty and diff cult es n [illegible] g maintenance and calibrat on of th s dea [illegible] ected early on With no temperature [illegible] ensation available this meant that the [illegible] would cont nue to be used for all available [illegible] agents provided that the detachable [illegible] was changed

Two B t sh Army anaesthet sts Jow tt and [illegible] described their experiences with TSA [illegible] part of the Parachute F eld Surg cal Team in [illegible] a ds [7] They concluded that the TSA [illegible] [illegible] o ed adequately at all times and [illegible] n n mal maintenance Both [illegible] employed d fferent techniques [illegible] on of anaesthesia however [illegible] c of nhalat onal anaesthesia was [illegible] SA vaporizers A total of 113 cases [illegible] er taken 143 vent lated and 70 [illegible] s mu taneously) Manual [illegible] of the self nflat ng Laerdal bag [illegible] o vent late he lungs with the [illegible] ventilat on being determined by [illegible] al wall movement Vent lat on [illegible] by another member of the field [illegible] allow the anaesthet st to be [illegible] [illegible] tasks Although safe and [illegible] r repo ed mar the bag [illegible] t was very t r ng At the end of the [illegible] h anaesthetists proposed that the [illegible] Laerdel bag should be replaced w th the [illegible] s l cone vers on to *provide a more s t ve feel for manual ventilation* [7]

The steady throughput of cases was [illegible] ntained as anaesthetists become more [illegible] lled with TSA n want me struat ons They were able to l me more precisely the speed with wh ch pat ents awoke from anaesthesia It was noted that on shutt ng off the OMVs the average t me to respond to command was less than 5 minutes [7] Some users noted that there was a frighten ng of anaesthesia after 10 15 m nutes which could have been exp a ned by the induct on agents eventually wearing off Another problem reported was that occas onally during spontaneous resp rat on the *Laerdal* valve d d not close properly and resulted n a r dilution of the volat le agents There were no recorded cases of awareness despite obv ous s gns of r ght anaesthesia This was thought to be a consequence of the amnesic properties of Tr chloroethylene [8]

By 1987 other volatile agents such as enflurane and isoflurane were start ng to be used n modern clinical pract ce It was considered that Halothane was no longer the ideal agent to use as the hypnotic component of a balanced anaesthetic techn que [10] Halothane had been shown to be more dysrhythmogenic than enflurane or isoflurane in the presence of endogenous or exogenous catecholam nes which would be high n acutely traumatized soldiers The risk of halothane hepat t s was also a real issue as battle casualties often need repeated surgery for mtial debr dement of the r wounds and then lot subsequent delayed closure Repeat exposure to halothane with the risk of l ver dysfunct on ensured that stud es of the newer

agents with the TSA were performed. Kocan [10] concluded that enflurane and isoflurane were acceptable alternatives to Halothane and that satisfactory anaesthesia was achieved in all the cases observed. It was also noted that in view of the shorter recovery time and the enormous cost differences, enflurane was preferable to isoflurane [10], although as enflurane had a higher MAC it would be unable to be administered as a single agent all sufficient concentration from one OMV. Others too [11] were aware of the current feeling about liver damage due to repeated halothane anaesthetics and commented that *it would be preferable if this were not used in the first instance where repeated procedures would be necessary*. It was also apparent in 1988 that the manufacture of trichloroethylene had been threatened in the past and that the future production could not be guaranteed. Wise words commented that the battle field was not the place for anaesthetists to be learning how to use a new anaesthetic agent as many were becoming unfamiliar with trichloroethylene.

Isoflurane and the TSA were investigated in more detail during the mid 1980s [12]. Having the physical properties of being non-flammable not explosive and chemically stable with a low rubber solubility it had the potential to be easily transported and could be used as a single agent. This would lead to the possibility of a single OMV in the TSA circuit. The low biotransformation of isoflurane fulfilled the criteria to allow for repeat anaesthetics on injured personnel and the suggested analgesic properties were also favorable. Induction and recovery were noted to be rapid. Other advantages included a stable cardiovascular system and little respiratory depression [12]. It was also no surprise that induction was complicated by coughing in a service population who were generally heavy smokers [13]. Later Trigg [14] compared isoflurane as a sole agent with the traditional agents of the TSA: halothane and trichloroethylene. He concluded that isoflurane provided *similar conditions of anaesthesia and analgesia with the added advantages of a lower respiratory rate, more economical use of oxygen and the requirement for only one vaporiser*. Not surprisingly Yoganathan and Houghton [13] found that both induction and maintenance anaesthesia were technically more difficult with isoflurane than with halothane when the two agents were compared. The respiratory depression and the pungency of the solution *resulted in a slower uptake of the volatile agent*. They were also concerned that a drawover technique was an expensive way to deliver isoflurane although this was counteracted by Trigg [15] as inconsequential in the military environment *when compared to the overall cost of operating a field hospital and the cost of the weapons making anaesthesia necessary*. As military casualties had a very high risk of aspiration it was considered better to intubate thus avoiding the slow and complicated gaseous induction experienced with isoflurane.

The next significant military deployment of the TSA was during the 1st Gulf War in 1992. The operating facilities available were now more sophisticated than that previously experienced in the Falklands War with the modern field hospital having an *integral generator-driven electricity supply which should continue to function in all but the most desperate conditions* [16]. Anaesthetists were also starting to use intravenous anaesthetics for maintenance on a regular basis and it was considered that a conversion from an infusion technique to an inhalational hand ventilated anaesthetic would be straightforward. This was considered a minor inconvenience when compared with the catastrophe of loss of theatre lighting, suction, monitoring and automatic ventilator on all of which would be lost if the electricity supply failed. The operating theatre complex was an open tented area consisting of eight field operating tables all of which were equipped with TSA Ohmeda 9000 syringe infusion pump and a manual sphygmomanometer [17]. There were also two Criticon Dinamap automatic non invasive blood pressure monitors available and four pulse oximeters. The potential for chemical weapons now played a more important role and so a further two operating tables were sited in a collective chemical

protect [illegible] agent [illegible] to [illegible] been [illegible] was [illegible] trichloroethylene [illegible] available in the UK in 1992 [illegible] from the war mobilization stock [illegible] was reserved for use on patients [illegible] suspected head injury only.

The TSA was subjected to the opposite temperature extremes that it had experienced in the Falklands conflict as temperatures of between 45-53 C were measured in a Gulf War operating room [18]. The TSA had not initially been designed for this extreme of temperature. Mardrew [18] was aware that the working temperature of volatile agents [illegible] OMV in the TSA had only been [illegible] the temperature range of 13 C [illegible] undertook a hospital based study [illegible] measured at minus [illegible] to [illegible] on a Datex Capnomac. Not [illegible] the temperature rose [illegible] 30 [illegible] the more dangerous the [illegible] OMV [illegible] became and various [illegible] were investigated to [illegible] the excessive isoflurane drawover [illegible] of the OMV.

The Cape TC 50 ventilator was issued to [illegible] hospitals to complement the Tri service anaesthetic apparatus and gained popularity [illegible] service anaesthetists. For reasons of [illegible] ease of assembly and good [illegible] ergonomics some anaesthetists [illegible] the Tri service apparatus using the TC 50 to push the fresh gas flow (pushover) through the OMV. A study by Taylor and [illegible] [19] looked at this configuration and [illegible] there was no difference in the [illegible] of the OMV in the pushover or [illegible]. In 2000 the production of [illegible] ventilator ceased as did servicing [illegible] spare parts [20]. It became clear [illegible] would become necessary [illegible] Comp Pac 200 ventilator [illegible] Medical Wirral UK) had [illegible] standard military ventilator issued [illegible] [21].

As Sevoflurane had started to enter [illegible] practice this new agent was investigated [21] as it was a becoming a [illegible] agent for use with patients with a compromised airway. Mellor and Hicks performed a study [21] to assess the maximum deliverable concentration of sevoflurane via the TSA. The results also [illegible] that low concentrations of sevoflurane were delivered relative to those that would be expected with other anaesthetic agents in the draw-over mode [illegible] the delivered sevoflurane concentration was [illegible] in the pushover mode. The study concluded *that maintaining a sufficiently high concentration of sevoflurane for long enough to achieve deep anaesthesia for intubation would prove very difficult and that adding more OMVs would provide little additive effect*. It was disappointing that when two room temperature OMVs with sevoflurane were both turned to maximum output the maximum concentration of sevoflurane achieved was only 4.5% and this fell to [illegible] within 2 minutes in the draw over mode. The authors recommended that sevoflurane should not be used for induction of anaesthesia with the TSA [21].

Due to the nature of their injuries many of the patients in whom the TSA is used in the field will require pre oxygenation. The way that this was achieved has been the subject of much debate in the literature. As described earlier the original TSA was supplied with a Houtonox oxygen regulator with two preset flow rates of 1 and 4 litres per minute in an attempt to conserve oxygen. Although Houghton showed that supplementation with 4 litres per minute would raise the inspired FiO_2 to 0.6 this was before it had been demonstrated that higher levels of inspired oxygen were required for effective pre oxygenation. The oxygen cylinder attached to the TSA only delivered at 4 litres per minute to aid oxygen supplementation using a reservoir tube and T piece. It was considered that anxious and unpremedicated patients would be likely to have a higher minute volume when asked to breathe deeply during pre oxygenation. It was also considered that

with an oxygen supplement of only 4 l/min per minute and a minute volume of 20 l/min per minute the resultant FiO2 would be less than 0.4 [15]. Several methods to improve this have been described, one of which is the positioning of an extra oxygen reservoir at the open end of the reservoir tube. This comprised simply of a 100 x 50 cm plastic bag fitted around a piece of disposable plastic breathing system tubing that could hold about 40 litres of oxygen collected over a 10 minute period. The patient then breathed the contents of the bag through the draw-over apparatus. This was considered to be *easy to use, inexpensive and portable* [22]. Houghton rightly commented [23] that pre-oxygenation studies had demonstrated that *three maximal deep inspirations were as effective as 3–4 min of normal respiration using pure oxygen and that by using a 20-litre bag prefilled with oxygen effective pre-oxygenation could be achieved using three maximal deep inspirations assuming a vital capacity of 6 litres*.

Recent conflicts in Afghanistan and Iraq have seen military surgeons and anaesthetists being required to operate on civilian casualties including children. A recent study [24] reported no significant difference in the work of breathing between the *Mapleson F* and the TSA and that a lower weight limit of 10 kg could now be recommended in clinical practice.

It is clear that the TSA has been a most valuable servant for the British Military and still has a vital role in providing anaesthesia in remote and dangerous situations. Unfortunately the equipment does not carry a *CE mark* and so cannot generally be used in civilian practice in the NHS without permission. As a compromise Military Anesthetists attend simulation training courses and deploy as Specialists. Registrars undertake supervision to learn how the apparatus functions prior to deploying as a consultant. Future miniaturization of anaesthetic equipment and the increasing usage of newer agents such as desflurane and xenon will all determine the future role of TSA in military deployments.

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Pulmonary Fitness for Underwater Pressure Exposure: a review of current Procedures and Standards

R Milner

Introduction

Pulmonary function testing (PFT) within the Royal Navy is performed in the PFT laboratory functionally part of the Environmental Medical Unit (EMU) at the Institute of Naval Medicine (INM). The laboratory employs a full time Medical Technical Officer (MTO) who reports to the Head of the Environmental Medical Unit (HEMU). This facility is unique within the Armed Services with respect to the output it provides. The quality of its processes and outputs have been assured by a recent review by a RN consultant in respiratory medicine.

Background

PFTs are performed on individuals with a history of wheezing or asthma prior to entry in the Royal Navy and on enrolled personnel who wish to undertake specialist duties e.g. Divers Submariners or Aviators (who will use the Short Term Air Supply System (STASS)) but have failed respiratory criteria in accordance with extant Military medical standards (1,2). In addition to those individuals about whom there are concerns on a screening Vitalograph for diving, submarine escape tank training (SETT) or STASS may require PFTs following referral to the Department of Diving & Hyperbaric Medicine (DD&HM) at INM. Referrals for pre-service entry PFTs are made by the Senior Medical Officer Service Entry (SMO(SE)) at INM. It must be stressed that the PFTs are performed to meet occupational standards for underwater pressure exposure and not to diagnose asthma. This differentiation between asthma and exercise induced bronchoconstriction is reviewed elsewhere (3).

Military training in underwater [illegible] also complies with [illegible] legislation (4).

Referral procedure

Any individual failing the current military respiratory standard for entry or promotion to [illegible] specialist occupational groups will be referred to INM and be dealt with by two separate pathways. Some of these failures will NOT proceed to PFTs as they are already [illegible] rejectable for example if they have excessive PEFR variability).

1. Potential general entry candidates are referred by SMO(SE) to the EMU where the individuals PFTs will be scrutinised and reported on by one of the EMU civilian Medical Officers.

2. Potential direct entry Divers and Submariners (referred by SMO(SE)) and all enlisted ranks (referred by Unit Medical Officer) requiring fitness decision for diving, SETT or STASS are referred to DD&HM at INM. A DD&HM Medical Officer (MO) will scrutinise these results and report back to SMO(SE) or Unit MO.

These appointments are currently booked by the DD&HM Administration Office. In each case a 28 day Peak Expiratory Flow Rate (PEFR) diary will be requested.

A provisional appointment reflecting the requirement to fill in the 28 day PEFR diary will be given to the individual. The PEFR diary should be scrutinised by the referring Unit MO

prior to the [illegible] appointment [illegible] that grossly abnormal [illegible] with DD&HM. The PFT may no[illegible] required [illegible] references and [illegible] appointment [illegible] for another [illegible]

Referrals to DD&HM [illegible] pathway 2 [illegible] using a Standard Operating Procedure [illegible] appointment [illegible] following 3 groups:

[illegible] Diver[illegible] Special [illegible] SETT candidates Army [illegible] Service [illegible] divers STASS

The [illegible] PFT referrals to DD&HM are [illegible] appointment 6-8 weeks following referral and where possible will be given a fitness decision on the day of testing.

Annual referral patterns

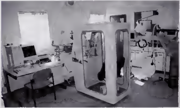
An internal survey carried out in the DD&HM revealed that 172 PFTs were performed between January and December 2006. Of these, 130 were for SETT, 36 for Diving and 6 for STASS fitness decisions. Sixteen percent (29/172) of patients were made permanently medically unfit and eleven percent (19/172) were found to be temporarily medically unfit pending further investigation. Average time from date of referral letter to reply by DD&HM was 6.7 weeks (6t[illegible]). In 2007 78 General Entry Candidates were assessed by the PFT Lab.

PFT laboratory procedures

The PFTs are performed in accordance with current Association of Respiratory Technology & Physiology (ARTP) and European Respiratory Society (ERS) guidelines.

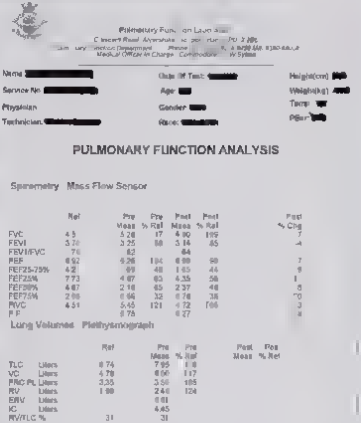
The laboratory is set up as per Fig 1 with plethysmography box, bicycle ergometer and computer in addition to a standard Vitalograph.

Prior to commencing PFTs each candidate fills out a Respiratory Symptoms Questionnaire. The first step in the PFT process is to perform a standard Vitalograph. The patient then moves into the plethysmography box and spirometry by mass flow is performed followed by lung plethysmography and Diffusion using inert gas (Methane) dilution. Flow-volume loops are also generated at this time. Examples of the results of all of these parameters are shown in figures 2-4.



The next step is to exercise the patient using the bicycle ergometer to a level of 150/200 Watts per minute for 10 minutes. The mass flow spirometry and flow-volume loops are then repeated immediately after exercise and at 10 minutes post-exercise.

For general entry patients this is the end of the process. For specialist groups (SETT Diving, STASS) reversibility testing with 2.5 mg of salbutamol is then performed. Again mass flow spirometry and flow-volume loops are repeated. The whole process takes approximately 2-3 hours.


Pulmonary Function Laboratory
Clement Road, Alverstoke, Hampshire PO12 2DL
Laboratory Technician Department Phone: [redacted]
Medical Officer in Charge: Commodore [redacted]

Name: [redacted] Date Of Test: [redacted] Height(cm): [redacted]
Service No: [redacted] Age: [redacted] Weight(kg): [redacted]
Physician: Gender: [redacted] Temp: [redacted]
Technician: [redacted] Race: [redacted] Pbar: [redacted]

PULMONARY FUNCTION ANALYSIS

Spirometry Mass Flow Sensor

	Ref	Pre Mass	% Ref	Post Mass	% Ref	% Chg
FVC	4.5	5.28	17	4.90	109	7
FEV1	3.78	3.25	86	3.14	83	-4
FEV1/FVC	7%	62		64		
PEF	9.52	9.26	104	9.88	90	7
FEF25-75%	4.2	3.9	48	1.85	44	9
FEF25%	7.73	4.87	63	4.35	56	1
FEF50%	4.67	2.10	45	2.37	48	6
FEF75%	2.08	0.66	32	0.78	38	10
PIVC	4.31	5.45	121	4.72	106	-3
PIF		0.76		0.27		-8

Lung Volumes Plethysmograph

		Ref	Pre Mass	Pre % Ref	Post Mass	Pos % Ref
TLC	Liters	8.74	7.95	91		
VC	Liters	4.78	6.66	147		
FRC PL	Liters	3.35	3.56	105		
RV	Liters	1.89	2.46	124		
ERV	Liters		0.81			
IC	Liters		4.45			
RV/TLC	%	31	31			

Diffusion Single Breathold

	Ref	Pre Mass	Pre % Ref	Post Mass	Pos % Re
DLCO mmol/kPa/min	10.4	11.5	111		
VA Liters	8.74	7.39	169		
DLCO/VA DLCO/L	1.54	1.56	92		

Figure 2

Interpretation of PFT results

PFTs performed for SETT Diving and STASS are reported by DD&HM personnel. EMU personnel report on the general entry PFTs. In the vast majority of cases the PFTs reported by DD&HM are communicated to the patient on that day and a fitness decision is given to the patient at that time. Only when there are outstanding investigations pending will the patient leave INM without a formal decision.

Which parameters are focused on in making fitness determinations?

DD&HM fitness standards have developed over the years through integration of military and civilian (Royal Brompton Hospital) expert knowledge and practice and some notable studies such as that carried out by Brooks and Pethybridge at INM (7) looking into submarine escape training safety.

Peak Flow Diary variability is calculated by subtracting the lowest value from the highest then dividing this value by the highest expressed as a percentage e.g. Highest 600 lowest 540 would be 600-540/600 – 10%. The highest/lowest values are taken from the whole 28 day period. The upper limit of our current standards is a variability of no more than 15.

The accepted limits for changes in FEV1 and PEFR post-exercise or post bronchodilator

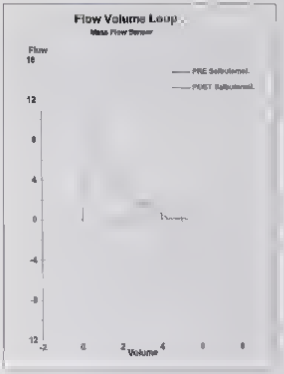
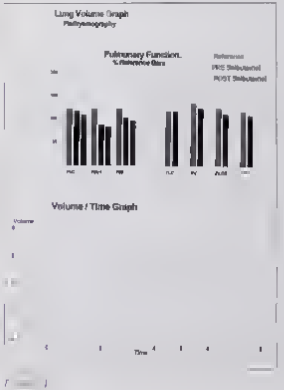


Figure 3



challenge are a maximum drop of 15% post exercise and a maximum increase post bronchodilator of 15%. The shape of the flow-volume curve is assessed for signs of obstructive lung pathology.

Plethysmography gives values for total lung capacity and residual volume whilst inert gas dilution gives values for accessible volume. These parameters can be compared to give clues as to the likelihood of areas of lung which have volume but are not ventilated e.g. lung bullae. Some of the data on the results sheets are not formally interpreted but simply observed. No single value outside accepted limits would imply failure. When making the final fitness determination the history examination, Respiratory Symptoms Questionnaire, volunteer status, chest x-ray and PFT results all help to inform the risk assessment.

Quality assurance

Daily calibration and regular quality assurance tests using biological control are performed.

Staff training for the MTQ is conducted along ARTP and ERS guidelines. Medical Officers new to DD&HM will spend a minimum of 3 months shadowing a senior member of the team prior to interpreting results themselves. A senior consultation is still usually performed by non specialist grades after this time. Less clear cut decisions are discussed within the department to derive a consensus view. The opinion of the visiting consultant in respiratory medicine may also be sought. Particularly interesting or challenging PFT results are discussed at quarterly departmental meetings. If a case remains doubtful the option of referral to the Royal Navy Civilian Consultant Advisor in Physiology at the Royal Brompton Hospital may be taken.

Audit of procedures is carried out at intervals as dictated by the INM PFT SOPs. For example the most recent internal audits looked at the quality of FMed 7 reply letters generated following consultation (8) and how efficiently the appointment system is managed (9).

Patient satisfaction reporting is an integral part of the PFT process. All candidates are

given an anonymous satisfaction questionnaire the responses to which are interpreted and formally reported (10) independently of DD&HM by a Chartered Health Psychologist from the EMU

Summary

The PFT SOPs developed by the DD&HM provide a standardised framework by which individuals requiring PFTs for service occupational reasons receive co-ordinated administration consistent medical opinion and the opportunity to provide feedback. The SOPs have built in audit standards to ensure clinical governance is maintained

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FEV1/FVC d[illegible]
results of [illegible]
Subma[illegible]
and date[illegible]
Repo[illegible]

8 M[illegible] RA M[illegible]
SOPs Au[illegible]
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9 Milne RA P[illegible]
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Te[illegible]
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NM Repo[illegible]

Surgeon Lieutenant Commander R Milner Royal Navy

General

Major Medical Incident - A Nurse's Tale

S Hale

The intention of this article is to describe a Major Medical Incident (MMI) declared by a BMH (COB BASRA) Operation TELIC 11 during the so called Battle for Basra. The intensive care perspective is intentional and should demonstrate various issues at play during the period in question along with the solutions at the time and lessons learned.

The incident in question occurred within twenty four hours of a previous MMI arising a period of intense fighting between insurgents and an Iraqi led infantry assault of suburban areas of Basra involving elements of UK and US forces. The BMH was supporting over run Iraqi medical facilities following an agreement between GOC British Forces and the Iraqi General in charge to provide Role 2 enhanced support for Iraqi soldiers and police. Exit strategy for Iraqi in patients was US rotary and fixed wing assets evacuating individuals to the Iraqi run Medical City unit in Baghdad or to a US medical facility in Balad. Typically Intensive Care or High Dependency patients took between twenty four to thirty six hours to evacuate by dedicated US CCAT helicopter teams on stand by for the period in question. Similar timescales existed for evacuating British forces via the Strategic CCAST route.

BMH ITU/HDU consists of 2 ITU beds and 2 HDU beds with the ability to surge to 4 ventilated patients for 72hrs. Staffing at the time of the incident was six RGNs plus NOIC ITU qualified one with ITU experience having been cut from 10 due to the low tempo of previous operations. Present during the period in question were one RAF CCAST nurse, two Army nurses and 2 nurses from the Royal Navy. Operational tempo at the time was high enough for new evacuation arrangements to be agreed between UK, US and Iraqi forces intentionally reducing the

speciality in the COB BMH in anticipation of further influx of large numbers of casualties as civilian medical facilities in Basra overflowed or were damaged. SOPs for MMI mobilise all members of UK Med Group and involve ITU RGNs assisting ED during major trauma as scribe nurse.

MMI had been declared the previous day involving eleven T1/T2 patients from 15 in Iraqi ITU received three ventilated patients including one 4 yr old child. The stand by for MMI on the second day was announced at 1400 while liaison for evacuation via US CCAT teams was underway. This incident involved 9 patients in total seven of which were T1/T2 initially 4 were classed T1. Upon assessment two were reclassified T2. MMI was not declared. Due to the agreed staffing levels on ITU/HDU it was still necessary to stand to the night staff at this time to allow the day staff to commence ate on preparing the existing patients for evacuation. These 2 staff were utilised in ED to scribe in Majors for the T1 casualties as the patients were assessed. The first T1 (from here-on patient 4) was handed over suffering from a gunshot to the head although after assessment in ED no entry wound was discovered. He was ventilated and transferred to CT at 1600 involving an anaesthetist ODP trauma doctor ITU scribe an ED nurse and a CMT. The second patient (patient 5) admitted was suffering from trauma to the legs abdomen and chest.

The US facility in Balad accepted the three existing ventilated patients who were immediately prepared for transfer. The helicopter arrived within the hour along with a US CCAT team whose differing medical equipment necessitated changing of all infusions and changes of ventilator tubing as well as physical transfer and securing to

stretchers. The importance of ventilated beds becoming swiftly available increased as more casualties were expected to arrive. To do this solely required more staff to prepare patients 13 for evacuation. At ED, medical and surgical nurses were employed elsewhere so that the consultation with hospital management, a physiotherapist was assigned to assist as directed on the ITU. The pharmacist and medical store man were directed to the unit to replenish consumables in order to maintain efficiency during the move.

By 1730 patient 5, suffering from thoracic trauma, was admitted to the operating theatre (OT) and was expected to require lengthy surgery. Patient 4 was diagnosed with a closed head injury and returned to ED. The ITU nurse attending patient 5 as scribe was then stood down to prepare for night duty. While awaiting CT results from UK this patient was managed by the anaesthetist and the ITU nurse in order to free ED staff to prepare for potential further casualties. Also for this reason it was decided at 1740 to transfer patient 4 to the fourth ITU bed, rather than block a trauma bed for several hours, effectively closing the unit to further admissions until CCAT evacuation was complete. Successful efforts were made by the hospital management cell at this time to persuade Belad to accept patient 4 as a further CCAT transfer on the airframe currently waiting for patients 13 in order to free one further ITU bed. Unfortunately, during the handover to the US team at 1830 it was reported from UK that patient 4 had suffered a non survivable diffuse brain injury from blunt trauma. Had MMI been declared this patient would then have become a T4 expectant casualty and could possibly have been moved from the unit to free one ventilator equipped bed. A decision was made between medical [illegible] ing and management [illegible] to leave patient 4, although active treatment was suspended at that time. [illegible] regarding incoming casualties. Lee [illegible] moved and to move patient 4 [illegible] to leave with the smoothness [illegible] patients 13. Unfortunately [illegible] became clear that patient 5 in OT [illegible] Even as surgery was suspended [illegible] patient died shortly afterwards.

[illegible] patient 4 died in ITU at [illegible] CT [illegible] was handed to the [illegible] dependent in order for the [illegible] ITU [illegible] to prepare for night duty. [illegible] was [illegible] to [illegible] for the [illegible] by the Padre for the small [illegible] remaining during the [illegible] night staff returned to the unit at 1915 all transfers were complete and the [illegible] left at 2005 allowing day staff to stand down. ITU was able to declare 4 beds available by 2130.

During this hectic period MMI was not declared, allowing the hospital management team to maintain acceptable staffing levels and operational effectiveness of the majority of the off-watch staff in the hospital throughout. Although operational tempo at that time was at its highest point and Basra's organic medical facilities were no longer able to accept casualties, the evacuation route from the Iraqi forces in Basra allowed enough time for the scenario to come to a conclusion before further casualties arrived at the BMH later that night. Due to the agreed decrease in staffing on ITU more flexibility was required of staff there to maintain full effectiveness of the department. This was ably managed with the assistance of hospital management and the cooperation of the US facility in Belad and their team: physiotherapy department, pharmacy and medical stores, OT, SQMS and the Padre, along with the radiology department and their support in the UK.

Lieutenant S Hale QARNNS, Op TELIC 11

General

Operation Telic – A Personal View

T E Wardley

There are fifteen casualties arriving via IRT in ten minute unknown triage category

That was the message from the Hospitalmanagement Cell (HMC). As I put the phone down I could hear the helicopter coming in. I quickly donned body armour and helmet and made my way to the Helicopter Landing Site. This would be the third trauma call of the shift. We had already had two Major Medical Incidents (MMIs) over the previous two days – no wonder they say things always happen in threes. How on earth did I get myself involved in this?

I deployed on Telic 11 to work in the Emergency Department at BMH Basrah from February to June 2008. There were four of us from MDHU Dernford going together myself, POMA Wilson, LNN Wakeford and LNN Meaking. We'd got to know each other quite well with all the pre-deployment training. As this was the first operational deployment for all of us we weren't really sure what to expect – we knew that the base had received quite a lot of Indirect Fire (IDF) but only a few trauma patients over the preceding few months. We were also wondering what it'd be like working with the Army. We were soon to find out.

We had a sobering start to our tour. The night we took over as individual replacements we faced our first IDF attack and trauma call. I could finally appreciate what it was like to come under attack – it wasn't pleasant. At least one part of the OPTAG training was utilised straight away – the Immediate Action (IA) drill. It was a skill we refined time after time during our tour. Whether we were at work or in the galley (a term we maintained throughout our tour you'll be pleased to know) we could be relied upon to hit the deck straight away. Some people sustain injuries on this way – the greatest misfortune I experienced was to nip my Abu Tmuss poster – kindly donated by Lt Gav Clarke QARNNS – as I dived for cover. A sad day for the whole tent.

As our first month got under way we got to know our teams and got a handle on the type of nursing care we needed to deliver. As we covered primary care in the evenings and weekends patients presented with all sorts of ailments and minor injuries – ranging from the serious to the absurd (an individual presented with a paper cut at 0300hrs while conducting a 'letter sweep'). It must be an Army thing. There were a smattering of traumas – mostly due to Improvised Explosive Devices (IEDs) and mostly involving local people. We usually had a lot of notice if the patients were coming via ambulance but less if it involved the IRT because of our close proximity to Basrah itself. That all changed on 26 March when the Iraqi Security Forces (ISF) decided to clear the city of militia and take on their backers at the same time.

The first three days of what has become known locally as the Battle of Basrah saw us treating large numbers of T1 and T2 patients as well as walking wounded. Most of the casualties were Iraqi soldiers. However we also treated children caught up in the crossfire. It wasn't always easy to identify whether the casualty was part of the ISF or from the other side – so all patients were thoroughly searched for weapons and ammunition by the Quartermaster's staff while triaged them before they went into the Emergency Department – yet another change from 'normal' emergency care practice.

Patient care – needless to say – was first

class A trauma call miraculously produces an ED Consultant, a Consultant Anaesthetist, two Consultant Surgeons, the ED NOIC, the SNO, the ITU NOIC, an ODP, a lab technician, a radiographer, in addition to the nursing team on duty. As is the wont of senior emergency care nursing officers, the NOIC was in her element directing all to their positions and relegating any other hangers-on to the side lines. The function of the trauma team was to resuscitate and stabilise the patient sufficiently to get them to surgery. With the Operating Theatres right next to ED this was done with the minimum of fuss. The patients were operated on and after recovery were moved back into the Iraqi health care system as quickly as possible, either via aero-medical evacuation away from Basrah or via ambulance.

The large influx of patients resulted in two MMIs in two days. All ED staff were utilised as well as physiotherapists (x[illegible]) and the GU and mental health teams (b[illegible]d). The Padre (Rev McCullough RN) kept [illegible] Haribo sweet supply in full working order. As the end of the local hostilities the patient flow naturally diminished and things returned to 'normal'. The team had been tested and was not found wanting.

I've learnt a great deal over the last three and a bit months about myself and about trauma (my Derriford colleagues will be relieved to know). The increased operational tempo has meant that many of us in the RN have experienced first hand what it is like to treat patients in a hostile environment. There has been a permanent RN presence in the ED at BMH Basrah for an extended period of time. I took over from Lt Gav Clarke and handed over to Lt Andy Clarkson, illustrating a continuity that will continue to strengthen the RN Medical Branch in years to come.

Lieutenant T E Wardley QARNNS

Service News

Blood Red Dinner – Friday 21 September 2007

Speech given by Surgeon Rear Admiral P J Reffell: QHP MSc MBBCh MRCGP FFOM

Major General Rose, Admiral Rawlins, Commander Keefe, Ladies and Gentlemen.

I think that you will agree that we have enjoyed a fine Dinner in HMS Nelson this evening and in that context I would like to thank Commander Patrick Keefe the Mess President for his permission for us to dine here this evening. I would like also to thank on your behalf our Matron-in-Chief Mr George Morris and our Chief Domestic Mr John Stock. Our thanks are also due to the Orchestra from the Band of Her Majesty's Royal Marines Portsmouth under the direction of WO2 Bandmaster Williams for their inspirational music and superb playing.

Once again the year since the last Blood Red Dinner has seen a remarkable amount of activity and change for the Royal Naval Medical Service.

I believe the new role of MDG(N) as Tribal Chief is now bedded in well and we have recently welcomed Surgeon Commodore Douglas Riley's post as Director Naval Medical Services position to better reflect his role as the day to day head of the RNMS. And although the RNMS does not have an independent medical 2* the reorganisation of DMSD as part of the Top Structures – Next Steps Project has seen the creation of an additional medical 2* Assistant Chief of Defence Staff (Health) and I am delighted that Surgeon Rear Admiral Lionel Jarvis has been selected for this position. Many congratulations.

I will not pretend dwelling too much this evening for the various change programmes that the medical services except to say that for the various challenges and at a time of sustained high operational tempo we are broadly on track. Areas of significant progress include the establishment of Surgeon General as the 3* medical Process Owner for Healthcare and Medical Operational Capability supported by an Inspector General and also the establishment of the new Joint Medical Command which will achieve full operating capability by April next year.

A critical enabler to delivering these various changes will be the move of SG's Strategic Medical HQ and the JMC HQ including the Defence Dental Service HQ to Lichfield as part of the Midlands Medical Accommodation project. The MMA project has now passed through the various scrutiny processes and is currently on the final approval phase ending next week. We are hopeful that the Minister will be in a position to confirm that MMA will go ahead before the parliamentary summer recess. The first phase will see the combined HQ building ready for occupation in the spring of 2010 and completion of the whole project by no later than 2014.

Turning back to the RNMS, its achievements over the last year have been tremendous.

Operationally all branches within the RNMS have been fully engaged in the delivery of the highest quality of medical care in Iraq and Afghanistan while continuing to meet all of Fleet's operational and exercise commitments and also delivering high quality Medical, Dental and nursing care to our personnel throughout the UK and all the various overseas units.

The Institute of Naval Medicine has continued to build on its capabilities with the relocation of both the Central Air and Admiralty Medical Boards and Defence Audiology to Alverstoke. Simultaneously it has been expanding its clinical support to environmental casualties from all three Services and continues to carry out essential research and development in areas such as

physical and mental stress n RN and RM personnel and trainees and works n support of operat onal devellopments nclud ng the NATO Submarine Rescue System as t undergoes acceptance t als

In add tron to support ng Fleet s world wide standing commitments nclud ng rhose n the av atron and submarine env ronments h ghlights for the RNMS have ncluded the medical support we prov ded n Tr stan Da Cunh n Operat on ZEST wh le Exercrse MEDICAL ENDEAVOUR saw rhe RNMS exerc smg ts full capab l ty from Role 1 ashore n support of the Royal Marines through ell of Ihe ichelons of care to RFA ARGUS in its primary Role as the Pi mary Casualty Receiving Fac Hty This was the largest RNMS exercise for a number of years and saw extensrve nvolvement of all ports of the RN Medrcal Serv ce we were delrghted lo see the Royal Marine Bandsmen exercrsmg n therr war role alongs de the RNMS and a s gnrficant nvolvement from the Royal Nevel Reserve which is currently undergoing a s gnificant re structuring to enable t to deliver its new role in prov d ng an enduring PCRF capab l ty n support of our Regular personnel And of course our RNR personnel have been play ng a srgn l cant role n support of todays operational comm tments

Exercrse MEDICAL ENDEAVOUR last year coincided with the Blood Red Dinner and reduced the avarlab l ty of our members lor Ihe dinner And although tonight s dinner was fully subscribed once again many of our personnel are sm larly unava lable as they are working up for their deployment to Afghanistan rn support of Op HERRICK 9 Well over 200 RNMS personnel coverrng pre hospital care the hosp tal squadron and the Medrcal Group HQ will augment the organ c med cal support we prov de to the Royal Mar nes as 3 Commando deploys to that country m a couple of months t me At the same time over 30 of our people from all branches and at all levels are preparing to deploy to Iraq on Op TELIC contr buting to our continuing medrcal support to that theatre

Th s w ll be our largest deployment for a generatron and w ll requ re an exceptronal effort not only from those deploy ng but also those charged w th conr nuing to prov de the healthcare requ red at home as many of the augmentees w ll be drawn from those S ckbays without rel ef

While I am under no illus on that we are asking our people ro deliver well above the mark and that thrs is caus ng srgn f cant strain it is also clear that the med cal care we are prov d ng s of the h ghest o der Thrs rs well recogn sed by Commanders and the sa lors soldiers and a rmen whom we support and rhe feedback I get s rhat thrs recognit on at all levals s keep ng us n good healt I have every fa th that we w ll corn nue to del ver

Ladies and Gentlemen I would ask you to stand to dr nk a roast ro rhe Royal Naval Medical Service end especially to those of our colleagues who cannot be w th us ton ght

The Royal Naval Med cal Serv ce

It is my great pleasure now ro rntroduce ro you our pr nc pal guest Major General John ROSE MBE General Joht n ned the Roya Mar nes n 1974 as a jun or off cer and r addt on to hold no a ser es of command staff and tra n ng appo nrments underrook operational tours n Northern Ireland and w h the UN n Cyprus He also en oyed a two year secondment as Operet ons Of cer n Th e Desert Regiment Sr lt an of Oman s Land Forces After Army Staff Colleqe n 1968 he was appo nted Chef of S aff Log s t cs n rh e United K ngdon Mobile Force and then commanded e co rrpeny n 42 Com mai dn Royal Mar nes this tour nc uded en operational deployment to Northern t elanc lor whrch he was awerded the MBE

Follow ng a tou n the M nistry of Defence he served as Chief of Staff n Headquarters 3 Commando Brrgade Promoted to Colonel n 1995 he joined the CINCFLEET before returning to MoD as Assrstent Director M ddle East which saw h n co ordinating the UK s m l tary commitments n rh a regron rncludrng be ng team leader rn the Iraq Cr ses Cell

The General then commanded 40

Commando Royal Marines from 1998 to 2000 before being promoted to Brigadier and appointed Director Intelligence Regional Assessments on the Defence Intelligence Staff (DIS). He became Director Intelligence Operations before serving for much of 2003 as the UK Chief of Defence Staff's Liaison Officer to the Pentagon. On completion of HCSC he commanded 3 Commando Brigade Royal Marines before taking up his current appointment as Director General Intelligence Collection in February 2006.

General Rose – we are delighted and honoured that you and Mandie are able join us here tonight.

Reply by Major General J G Rose MBE

Thank you for your kind invitation to this year's Blood Red Dinner. May I thank Philip for his kind words of introduction and join him in paying tribute to the chefs and mess staff for looking after us so well.

I am honoured to be your principal guest tonight. I should also tell you that I am a great believer that after dinner speeches should resemble a lady's negligee: suitably brief, completely transparent and touch on just a couple of points. I therefore hope that you will be reassured that it will not be too long before you get to the real business of the evening – catching up with old friends and acquaintances over a glass or two.

Mandie and I are delighted to be here among so many new friends because I think both the RN and Defence are superbly supported by the RN Medical Services. For me, the most important issue has been the medical support to those I have had the enormous privilege of commanding in several appointments in 3 Commando Brigade and I hold dear the advice I have been given when serving on the Brigade staff in the Fleet. That support and care has invariably been exemplary.

On reflection we perhaps take that support too much for granted: we instinctively know that the key motivation of all the doctors, nurses and medical staff is to deliver that care. But I am very clear that medical support plays a key role in contributing to operational effectiveness – something we must not forget. It is all about protecting our most precious resource – people.

Those like me who are not in the professions should perhaps not be surprised at your dedication and professionalism. From its beginnings the Naval Medical Service has had to contend with the great pool of diseases all in order to improve life at sea. We can only look back in admiration at those who dedicated themselves to the means of preventing causes of ill health of sailors and marines. Men like James Lind whose ground breaking achievements in finding a cure and prevent on for that most malignant and widespread of diseases: scurvy. It seems so simple now: more fruit and vegetables or when at sea for long periods preserved lemon juice. This remarkable man also made the connection between cleanliness and hygiene to prevent typhus. Another great was Gilbert Blane and his work on pulmonary tuberculosis. And we should not forget Mrs Eliza Mackenzie who in 1854 during the Crimean War led a party of six experienced nurses to the Navy's Base Hospital in Therapia near Constantinople. These ladies pioneered for the Naval Nursing Officers and ultimately in 1902 when Her Majesty Queen Alexandra signified it would be her gracious pleasure to become President of the Nursing Staff, Queen Alexandra's Royal Naval Nursing Service.

But all that was in a very different era and yet I believe the modern Royal Naval Nursing Service retains its pioneering tradition of excellence and care. One only needs to look at the facilities and medical staff at the Commando Training Centre over the last fifteen years and its pioneering work on stress fractures – as an example of a truly world class medical support and I do not use the term world class lightly.

When Commanding 3 Commando Brigade I recall seeing the medical staff and capabilities in RFA Argus as we exercised off the Eastern Seaboard States of the USA. It left me with

huge confidence that should the need arise we would be in very sound medical hands None of us should be surprised the doctors nurses administrators and musicians that made up the medical teams during the Falklands Campaign demonstrated their capabilities comprehensively and most professionally

More recently during my visits to operational theatres in Iraq and Afghanistan both when commanding the Brigade and in my current appointment I have continued to see that dedication service and flexibility to operate whether on land or at sea and in the joint arena alongside our sister Services

So for all of that I celebrate with you tonight and I salute you of the Royal Naval Medical Services past and present I understand the Dinner tonight is being held slightly earlier than usual because many will

[redacted] To those [redacted] If there I wish you [redacted] safe [redacted]

[redacted] Good [redacted] occasion [redacted] a time [redacted] people [redacted] experience [redacted] private [redacted] ought to [redacted] by those at whose [redacted] the lives and [redacted] how those [redacted] Medical Service will play their part [redacted] integration – but I also understand the underlying message that Commanders must do so as well

Ladies and Gentlemen – a toast to the Royal Naval Medical Club

Service News

Honours, Awards and Citations

Queen's Birthday Honours 2008

OBE

Surgeon Commodore (D) G L Morrison OBE Royal Navy

MBE

Commander M W Worrell MBE Royal Navy (Retd)

Defence Consultant Adviser

Surgeon Commander P Turnbull Royal Navy

Defence Consultant Adviser in Submarine and Radiation Medicine

Surgeon Commander R Ramaswami Royal Navy

Defence Consultant Adviser in Diving and Hyperbaric Medicine

Consultant Adviser

Surgeon Captain D Brown Royal Navy

Consultant Adviser in Occupational Medicine

Academic Achievements

Stewart Memorial Prize

Surgeon Commander A Campbell Royal Navy was awarded the Stewart Memorial Prize for achieving the highest marks in this year's Diploma in Aviation Medicine examination. He is the first Royal Navy doctor to win this prestigious prize in the 41 years of the Diploma examination.

Surgeon Lieutenant Commander F J H Binns Royal Navy

Doctor of Medicine Higher Degree

Surgeon Lieutenant Commander P Coates Royal Navy

FRCR Part 2B

Surgeon Lieutenant Commander G Wild Royal Navy

MRCGP

Surgeon Lieutenant L Morris Royal Navy

MRCP

Surgeon Lieutenant S Pengelly Royal Navy

MRCS

Surgeon Lieutenant Commander E Armstrong Royal Navy

Passed ASCAB Board

Surgeon Lieutenant Commander R Webber

Passed ASCAB Board

Obituary

Commander Ian Coulton Royal Navy (1956 – 2008)

Even though he was suffering from a serious and protracted coronary illness Commander Ian Coulton died unexpectedly on the evening of 1 February 2008

Few who knew him will be surprised to note that despite a gradual and marked deterioration in his health Ian as usual was at work as the Officer Commanding the Support Unit in Fort Blockhouse when this latest and subsequently fatal episode struck on 30 January He is survived by Gill his wife of some 25 years and his two teenage children Alice and Laurence

Ian was born in Leyland Lancashire in 1956 and was placed in the middle rankings of 10 brothers and sisters The family moved and settled in Preston where he was brought up and educated Being one of eleven children gives you robust survival skills and Ian was also from a family background that had an expectation that you got away from the family nest as soon as possible to make your own way in the world This perhaps helps to explain Ians remarkable drive and work ethic Accordingly he joined the Navy in 1972 aged just 16 As a stick thin wisp of a lad he quickly acquired the nickname Tich that was to be his main sobriquet for many years

Newly enlisted Junior Probationary Medical Assistant D136975L Coulton completed his MA Training in RNH Haslar but because he was too young to complete the practical aspects of the training on the wards he was loan drafted to a variety of ships to await his 18th birthday He finished his training and was to work in the wards in Haslar before being sent back to sea

Ian had many drafts and much fun as a young naval rating These included time in RNH Gibraltar HM Ships Heron Nelson Excellent Achilles and Southampton Additionally he served in SS UGANDA during the Falklands war

Ian was a hugely effective [illegible] quickly rose through the ranks This was recognised and he was duly commissioned a Medical Services Officer in 1986 whose appointments to the Institute of Naval Medicine and RNH Haslar quickly followed He was never destined to be a commando or a submariner as his talents lay in medical administration and man management Complete with his MBA in 1994 passing every module with distinction was a measure of his talent and intellect

Promoted Lieutenant Commander in 1996 higher appointments to DMSTC quickly followed and Ians reputation as an officer of considerable talent and merit was firmly established This ability and drive for excellence was further enhanced by an appointment to the Advanced Command Staff Course where he passed as usual and entirely as expected with distinction also gaining an MA in Defence Studies Post Staff Course saw Ian move to a job in Fleet where he contributed greatly to the operational effectiveness of all medical matters throughout the RN and RM He played an important role in the development of multinational integrated medical units in Bosnia and Kosovo which has proven to be the model for todays coalition medical units He subsequently deployed with US Forces to Iraq in 2003 and working with Polish medical forces establishing a comprehensive medical support chain as well as playing a lead role in the team working to re-establish the Iraqi health services

Promoted to Commander in 2001 Ian was appointed to the Defence Medical Services Training Centre as CO and COS to the Commandant It was during this appointment that Ians health was to become such a dominating factor for the remainder of his life

[redacted]

Ian's management style was always consistent. He called a spade a shovel and was the most illiberal of officers – he always judged people as individuals and cared little for gender, race, colour, politics or agendas not aligned to his job, his Service and the personal value set of a man who fought and worked hard throughout his life for all he achieved. As a fellow officer and friend, Ian could always be relied upon to give sound and considered advice. On many occasions this advice was not what we wanted to hear, but that cut little ice with him. If you asked you received the honest answer. One of the strengths of the Medical Services branch is that we can call upon each other for help and support. Ian's phone was one that rang a lot for this purpose and he always offered his time and experience selflessly.

He was a man who compartmentalised his life and his efforts were focussed around his family, his job and his hobbies, particularly gardening. He read avidly about the First World War and was very knowledgeable, especially concerning the land campaigns. Surprisingly for a sailor, Ian also drew in pencil and watercolour and he was pretty good. I suspect he would have got better. He was a man of many talents and he led a very full, rewarding life. He only had 51 years. He did not waste any of them, but he should deserve more.

Ian's value to the Royal Navy and Medical Branch is evident. In an award he will not now be able to collect, but has been granted to him nonetheless. Her Majesty the Queen, as the sovereign head of the Most Venerable Order of St John of Jerusalem, has graciously sanctioned his admission to the Order as Serving Brother. Grill will be presented with the medal later in the year.

Ian was first taken seriously ill in 2005 when the heart condition from which he was suffering became symptomatic. In spite of numerous setbacks and spells in hospital he always bounced back, determined in everything he did not to give in. Whether it was fixing something at home or fulfilling his responsibility at work, he never gave up.

Grill has asked that his legacy and example to us all be just that – he never gave up.

Commander W M Durning, Royal Navy

Notice has been received of the death of the following:

Surgeon Commander R P Doherty, Royal Navy (Retd)

The editor would welcome any words in memory of him.

Administration Notices

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Surgeon Commodore Dr G Morrison, Surgeon Captain J F Campbell, Captain L G Gibbon, Surgeon Commander P Hughes, Commander (Rtd) G Marshall, Lieutenant Lieutenant S Peake (*Secretary*)

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Editor, JRNMS [illegible] Naval Me[illegible]

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Precautions are to be taken to preserve the confidentiality of patients in text and illustrations e.g. by masking the eyes in photographs. Where a patient or subject might be identified from ar

Tuslation [illegible] wherein pe[illegible] and forwarde[illegible] experiments on h[illegible] be considered unless the [illegible] was approved by an appropriate ethics committee and followed and the authors state explicitly that each subject gave his or her informed written consent. A copy of the letter of approval issued by the ethics committee must be provided.

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Manuscripts must be in English in a form suitable for publication as against oral presentation. **Uniform Requirements For Manuscript Submitted to Biomedical Journals** (N Engl J Med 1997 **336**(4) 309-15) gives guidance. Scientific papers should be prefaced with an abstract of the hypothesis, argument and findings. This should not exceed 150 words. Headings within the text should be used to highlight the content of different sections. Where possible manuscripts should be prepared in Microsoft Word on CD or floppy disc. Otherwise they should be typewritten in double spacing on one side of A4 paper. The author should retain a copy of the disc/manuscript.

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The title page should contain a concise informative title, up to five key words, the names and initials of all authors and their appointments and the department(s)/institution(s)/ship(s)/establishment(s) where the work was carried out.

Tables and illustrations

Tables and illustrations (figures) should add to the paper rather than only repeating information presented in the text. Each table and illustration should be on an individual page separate from the text, be numbered in two distinct sequences in the order in which they are mentioned in the text and have an explanatory caption (typed on a separate sheet for illustrations).

News photographs of academic, social, sport or other occasions involving members of the Royal Naval Medical Service are welcomed.

Normally printed illustrations will be monochrome. The views of the Editor should be sought where colour illustration is thought to be essential or highly desirable. Photographs must be of good quality glossy unmounted and be provided in camera ready form with redundant areas trimmed off. The figure number, author's name and top/bottom should be marked on the back. Line drawings should be professionally drawn and labelled or of equivalent standard and submitted as photographic prints or high quality photocopies. Lettering and numbering should be sufficiently large to ensure legibility after reduction for publication. Freehand lettering is not acceptable.

Measurements and abbreviations

Measurements should be given in the units in which they were made but, with the exception of blood pressure in mmHg and haemoglobin concentration in g/dl, non-metric units must be accompanied by metric (SI) equivalents. The approved name of drugs should be used (proprietary names may follow in parentheses). If an abbreviation is used, the term for which it stands should be given in full at its first mention in the text e.g. Institute of Naval Medicine (INM).

References

Responsibility for the accuracy and completeness of references lies with the author(s) and these will not be checked by editorial staff. Only essential references should be included and authors should verify them against the original documents. References are identified in the text by superscript Arabic numerals and are numbered and listed consecutively at the end of the manuscript in the order in which they are first cited in the text. A full list of references should be given at the end of the paper using the form of reference adopted by Index Medicus. Papers accepted but not yet published should be included in the references followed by (in press). Those in preparation (including any submitted for publication), personal communications and unpublished observations should be referred to as such in the text only.

Acknowledgements

The assistance of those who are not authors but made substantial contributions to the study and/or preparation of the paper should be acknowledged as should the source(s) of grant support, equipment, drugs, facilities etc.

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Contents

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Editorial

It is a great privilege for me to take over as Medical [illegible]
Naval Medicine and with it the editorship of this [illegible]
features of my Royal Naval medical career to date [illegible]
appears to be accelerating. I would like to give dre [illegible]
Jim Sykes for keeping both shows on the road.

At the time of writing, the Royal Navy Medical Se [illegible]
Herrick 9 to Afghanistan, where for the first time we [illegible]
infrastructure including the command and maintenance [illegible]
enhanced medical facility at Camp Bastion. More [illegible]
the emphasis in Defence is very much on land oper [illegible]
fact that it is our role in support of the Fleet and Roya [illegible]
requirement for the Royal Naval Medical Service [illegible]
manpower to backfill the Army. Despite this [illegible]
involving the provision of [illegible] the Role 1 2 [illegible]
relatively stable. It provides the justification for [illegible]
LPH facilities although [illegible]
these roles of care in a RN context currently [illegible]

That brings me to the role of this Journal [illegible]
high quality scientific papers [illegible]
dedicated researchers [illegible]
medical family of the work going on [illegible]
containing articles of specific information [illegible]
the heritage and esprit de corps of the [illegible]
and would seek to be a publication that [illegible]
have tried to start this theme by [illegible]
on Top Structures – Next Steps [illegible]
update from the Director of the Roy [illegible]
Headquarters medical [illegible]
Journal of the Royal Army Medical Corps [illegible]
edition.

The next management committee [illegible]
interim, as well as scientific [illegible]
experiences of medical staff [illegible]
achievements, and articles of [illegible]
appreciated.

David Brown

J Royal Naval Medical Service 2008; 94.3 108-111

Clinical

Hepatitis B infection following deployment to Angola

A M Croft, J E Ollerton, N T Fear

Abstract

We describe the clinical illness and long-term follow up of two British personnel who acquired hepatitis B infection during a [illegible]-month UN mission to Angola. Medical officers need to be familiar with this viral illness, which may present in military personnel after any exercise or deployment to the tropics or subtropics.

Key words

UN, infectious disease, hepatitis B, Angola, immunisation

Introduction

In May 1995 a force of 642 British personnel deployed to Angola for 3 months as the British contribution to the United Nations Angola Verification Mission (UNAVEM). The British deployment was codenamed Operation Chantress and its purpose was to establish an enduring logistics infrastructure to support the later deployment of a 7200 strong UN force.

In the 6 months prior to deploying the British personnel at readiness to move were offered monovalent vaccine for [illegible] against hepatitis A, meningitis [illegible] polysaccharide vaccine against Neisseria meningitidis serogroups A and C) and typhoid fever. These mission specific vaccines supplemented the standard UK [illegible] on [illegible] the [illegible] BCG and polio [illegible] TAB1 [illegible] tetanus toxoid [illegible] vaccines against typhoid [illegible] and against paratyphoid fever A and B) and yellow fever vaccines. The deploying personnel were prescribed chloroquine 300 mg once weekly and proguanil 200 mg once daily as malaria chemoprophylaxis.

The deployed British force comprised a logistic battalion group based on [illegible] Support Regiment RLC. The group included elements of 13 other Army units or detachments and a RAF [illegible] movements cell. During the [illegible] the British logistic battalion [illegible] managed [illegible] accommodation [illegible] offloaded UN ships [illegible] large quantities of UN stores [illegible] stations and moved stores [illegible] newly opened roads.

UNAVEM was [illegible] to the [illegible] Angola [illegible] the fact that intense [illegible] between the previously [illegible] Bailey [illegible] closed [illegible] present [illegible] there were [illegible] in the British [illegible] convoy to the US [illegible] successfully [illegible] August 1995.

Some [illegible] the Operation Chantress [illegible] hepatitis B [illegible] [illegible]

Case A

The first case was a [illegible] serviceman who [illegible]

infantry guard company b[illegible]
Lob to 5 weeks after retu[illegible]
Angola he presented to h[illegible]
with a 4 day history of [illegible]
lethargy, loin discomfort [illegible]
examination was unremark[illegible]
MSU were normal and a vi[illegible]
diagnosed.

On review 3 days la[illegible]
jaundiced and now compl[illegible]
vomiting and passing dark [illegible]
abdominal examination [illegible]
tender right upper quadran[illegible]
liver. In addition, abdo[illegible]
showed an enlarged splee[illegible]
to the local civilian hosp[illegible]
found to have a raised [illegible]
[illegible]mol/l and a hepatic pat[illegible]
test results (ALT 228 U/l, AST [illegible]
alkaline phosphatase no[illegible]
were negative and hep[illegible]
HBV positive wit[illegible] HBsAg [illegible]
units. He was also HB[illegible]
HBeAg positive. A diagnos[illegible]
acute hepatitis B. He w[illegible]
two days to rest at hom[illegible]
follow up.

On review a month [illegible]
jaundiced and still HBV po[illegible]
with anti-HBeAG [illegible]
infectivity. His total b[illegible]
mol/l, his ALT to 115 U/l [illegible]
now within the [illegible]

He continued w[illegible]
follow up, and 3 months [illegible]
seroconverted and wa[illegible] HB[illegible]
was no longer considered [illegible]
o was discharged from [illegible]

The patient denied a[illegible]
Angola, and had no[illegible]
village emergency [illegible]

After his acute epis[illegible]
general health remained [illegible]
lapse of [illegible]
his military service [illegible] August 2[illegible]

Case B

The second case was a 24 yea[illegible]
He too was stationed [illegible]
to Case A he [illegible]

[illegible]

[illegible]nged ar[illegible] analys[illegible] both positive [illegible] made a[illegible] as res[illegible]

[illegible]

Discussion

[illegible]

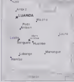

Figure Map of Angola

Declaration of Interests

The authors have no conflicts o

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J Royal Naval Medical Service 2008 94 3 112 114

Clinical

Audit of prescription of anti-malarial prophylaxis to patients admitted to Royal Centre for Defence Medicine (RCDM) following evacuation from Afghanistan

J Penn-Barwell, S Pengelly

Abstract

Introduction
For most of the year Military personnel deployed to Afghanistan are required to take anti-malarial chemoprophylaxis (AMC). This audit aims to quantify how many personnel taking AMC in theatre have it continued at RCDM.

Method
A database kept at RCDM was searched for details of all evacuated patients. Records of these patients were then searched to find out which had been admitted, how many had been taking AMC prior to admission and how many were prescribed it in hospital.

Results
During the study period 40 patients were evacuated to RCDM. 26 of these were admitted and had notes available and were therefore included in the study. 9 of these had been taking AMC prior to admission, of them only 4 had been continued on AMC by the time they were admitted to RCDM.

Conclusion
Insufficient numbers of patients taking AMC prior to admission have it continued as an inpatient. Awareness of this issue needs to be raised at all points of the medical evacuation chain.

Introduction
British Military personnel deploying on OP HERRICK to Afghanistan are exposed to a seasonal malaria risk. In accordance with current policy all ranks should be taking anti-malarial chemoprophylaxis (AMC) during the malaria season from 26 Feb to 21 Nov. All AMC regimes require continuation for a period after possible exposure. Therefore personnel who leave Afghanistan via medical evacuation should, depending on the time of year, be prescribed AMC at in RCDM.

It was observed by the authors that there were relatively high rates of compliance with AMC regimes amongst deployed personnel but low rates of AMC prescription in both the International Stability and Assistance Force (ISAF) medical facilities (principally the Role 2E facility in camp BASTION) and RCDM. This audit was conducted in order to quantify AMC prescription rates and attempt to investigate whether there was adequate enquiry into and documentation of patients current medications on admission to both facilities.

Standard
This study shall audit current practice against the standard that:

100% of patients admitted to British Military medical facilities on AMC should be continued on their Anti-malarial regime unless contraindicated.

Methods

Patients medically evacuated from Afghanistan via AEROMED were identified from the RCDM database drawn from the AEROMED signal log. Cases were included if they were evacuated to RCDM after the start of the malaria season (21 Feb) in 2007. The transition from HERRICK 5 to 6 (flag day) on 20 Apr 2007 was chosen as the arbitrary study cut-off point.

The RCDM notes (which included documentation from ISAF medical facilities) of the included patients were then examined according to the following criteria:

Whether the admitting medical staff had recorded a drug history at admission at both ISAF medical facilities and RCDM.

Whether the patient had been recorded as taking AMC prior to admission.

Wh[illegible] at both [illegible]

Results

40 patients we[illegible] 2 month study [illegible] retrieve the c[illegible] patients were not [illegible] ISAF medical fac[illegible] therefore exclude[illegible] were included [illegible]

Of the 26 pat[illegible] some stage [illegible] there was a doc[illegible] AMC due to a [illegible] 1 of the remaining [illegible] prescribed AMC [illegible]

This [illegible] AMC prescription [illegible] target of 100[illegible]. The [illegible] summarised [illegible]

Outcome	N[illegible]
Total number of patients identified	40
Excluded due to unavailable notes	5
Excluded as not admitted in Bastion/RCDM	9
Included patients	26
Drug History (DH) recorded in Bastion	
Bastion DH records patient taking AMC	9
Contraindication to AMC recorded	
AMC prescribed in Bastion *(% of patients on AMC prescribed AMC in absence of CI)*	[illegible]
DH recorded in RCDM	[illegible]
RCDM DH History records patient taking AMC	6
Contraindication to AMC recorded	1
AMC prescribed in RCDM *(% of patients on AMC prescribed AMC in absence of CI)*	1 [illegible]

Discussion

The British Military have repeatedly learnt the importance of adherence with AMC regimes repeatedly from the 14th Army in Burma 1944 to OP PALLISER in Sierra Leone in 2000.

Although A[illegible] in also [illegible] jungle [illegible] operat[illegible] universally [illegible]

Conclusions and Recommendations

J Royal Naval Medical Service 2008 94 3 115 116

General

Update on Top Structures – Next Steps

P I Raffaelli

In my role as Director General Strategic Change in DMSD I have been leading a change programme looking at the Leadership, Management and Governance of the Defence Medical Services. This work is known as Top Structures – Next Steps. The initial study took place last year and was carried out in collaboration with the 3 single Services and assisted by the Defence Management Consultancy Service and a Defence Internal Audit representative. The study report reached agreed conclusions last August and in January of this year, the Vice Chief of the Defence Staff (VCDS) issued an Implementation Directive. The detailed report and the VCDS Directive are on the DMSD website and my team and I have been undertaking a series of Roadshow presentations to DMS audiences in the UK and overseas to bring people up to speed with how the programme is progressing [illegible] to update readers of the JRNMS on [illegible] this work.

Firstly, what is TS(NS) [illegible] will not lead to a purple [illegible] Service; when the study was conducted [illegible] Service Chiefs of Staff were all [illegible] they wanted their people to join [illegible] Service by choice and to remain with their Service throughout their career. They [illegible] that medical [illegible] managed as a strategic asset [illegible] individuals' clinical capability [illegible] critical requirement [illegible] supple[illegible] appropriate [illegible] skill train[illegible] system which builds on the capability [illegible] single Service.

[illegible]

[illegible]

... with our NHS and academic partners. The project achieved formal approval in September at a cost of some £200 million pounds. The contract for the initial phase of the MMA project was signed on 20 October and will see a new HQ building which will house both SG and his strategic medical HQ and the HQ of [illegible]. This is planned to open by April 2010 [illegible] much reduced DMSD forward [illegible] in the MoD in [illegible] by a 2 star medical Assistant Chief [illegible] Defence Staff (Health).

Between 2010 and 2014 the site will be [illegible] to provide purpose built training and [illegible] facilities enabling DMSTC and [illegible] training elements from Fort [illegible] to relocate to Whittington. The site [illegible] sports and leisure [illegible] access to our own military [illegible]. At this stage everyone [illegible]

[illegible]

J Royal Naval Medical Service 2008; 94(3): 117-118

General

Medical Support to Navy Command Headquarters

T Douglas Riley

Over the past 15 years, in response to the ever-changing role and construct of the Royal Navy as a whole but also to budgetary pressures, there have been numerous changes in the headquarter organisations that support the Royal Naval Medical Service overall; these have resulted in a significant reduction in the size of the medical component of what is now Navy Command headquarters. This serial downsizing has taken place in parallel with significant changes in the way medicine is delivered, governed and assured across the UK. These national changes have resulted in a requirement for Healthcare Providers, of which the RN is one, to meet ever increasing national guidelines, standards and regulations, particularly in the field of Health Care Governance. The size of the medical HQ only allowed staff effort to be concentrated on fire-fighting current issues rather than looking at longer-term strategy and, perhaps not surprisingly, we have been failing to deliver all that we should.

We have recognised this problem since 2004 following a significant amount of work and collection of robust evidence have been able to demonstrate to the Navy the need for change. The argument was relatively simple: we are failing to meet nationally mandated standards and running at significant risk in healthcare delivery and the need to assure this delivery. We cannot do this because we do not have sufficient staffing horsepower. There are no more efficiencies to be found and the remedy is an increase in personnel. The argument was accepted and in the face of considerable financial constraint we have just fed the increase in HQ staff of an additional 10 posts. Some of these [illegible]

[illegible]

a recent DIN. A key component of the DRNMS post is having executive authority over medical [illegible] ties and personnel. This allows him to [illegible]ndate medical standards and impose [illegible] action and in extreme circumstances [illegible] close a medical centre or temporarily [illegible] an individual from clinical practice. Th[illegible] has given far greater clarity and we[illegible] and has been welcomed by all [illegible] Officers who often struggle [illegible] within their Commands [illegible] can remain stat[illegible] [illegible] further changes will be [illegible]. There is every confidence [illegible] the present structure will [illegible] the requirements [illegible] external bodies [illegible] Navy Comm[illegible] has a much better [illegible] years [illegible] that the HQ [illegible] line.

J Royal Naval Medical Service 2008 94.3 119-122

General

Surgical hand scrub: Are alcohol gel based preparations a viable alternative on overseas operations?

Mansoor Ali Khan

Introduction

The origins of surgical hand disinfection can be traced back to Ignaz Semmelweis in Vienna who developed a practice of washing his hands in chloride solution to prevent puerperal fever[1]. Subsequently Joseph Lister used carbolic acid sprays to decontaminate surgical wounds as he worked. The phenol in these sprays irritated surgeon's hands and to protect themselves from phenol burns they started wearing rubber gloves. This practice continues today although it is many years since carbolic acid was sprayed on open wounds[2].

Surgical hand scrubbing is described by the Centre for Disease Control as a process by which an antiseptic containing preparation is applied to the skin and in turn results in substantially reducing the number of microorganisms on intact skin. It is broad spectrum, fast acting and persistent[3]. During this process any micro-organisms that are loosely attached to the skin are almost completely removed. However the problem arises in removing micro-organisms that are imbedded in hair follicles and the ducts of the sebaceous glands.

For the purposes of hand disinfection the flora of the skin can be divided into resident and transient organisms. The resident flora (Staphylococci spp, micrococci and Propionibacter spp) colonise the skin and are removed with difficulty with simple hand washing and are incompletely removed by most disinfectants. The transient flora on the other hand (e.g. intestinal gram negative bacteria) do not usually colonise and are more easily removed[4].

Background

Two main categories of hand disinfectant exist: bacteriostatic and bactericidal, with the optimum agent possessing both qualities. The bactericidal effect is to kill bacteria with immediate removal of bacteria from the skin. A bacteriostatic effect would inhibit the multiplication of bacteria, [illegible] decreased, resulting in [illegible] wound infections [illegible] (Glove puncture [illegible] reported[5,6]. [illegible]

into three [illegible] wash now [illegible] Due to [illegible] procedure [illegible] [illegible] and [illegible] professionals scr[illegible] [illegible] to nearly 60 [illegible] [illegible] Field Hospital has [illegible] large quantities of [illegible] [illegible]

Water [illegible] deployed [illegible] especially in developing [illegible] [illegible] of water [illegible] be [illegible] HM St[illegible] [illegible] [illegible] large volumes of [illegible]

Materials and Methods

A comprehensive literature search [illegible] undertaken using the Medline, NCBI [illegible] PubMed databases. The terms [illegible] searching included *surgical hand s[illegible], water usage in theatre, alternate [illegible] hand scrub agents, surgical hand [illegible] agents, chlorhexidine, iodophor, p[illegible] based alcohol gels, ethanol based [illegible] gels and water preservation in the[illegible]*

Discussion

The initial question to emphasise is whether [illegible] requirement to wash the hands [illegible] [illegible] of the procedure. Hubner et al [illegible] undertook a study which utilised 20 healthy [illegible]. The volunteers undertook hand [illegible] with either a propanol based [illegible] either with or without preceding hand wash. [illegible] swabs were taken from [illegible] immediately after disinfection and [illegible] effect was determined by taking swabs after [illegible] hours. The results obtained demonstrated that preceding hand wash has the most negative influence on the immediate bactericidal effect and should only be undertaken if a good reason [illegible] available, i.e. visible soiling.

A similar study undertaken by the same authors (Hubner et al [11]) demonstrated similar findings. They established that there was limited benefit of hand washing as part of surgical hand disinfection when using alcohol based hand rubs. In volunteers whose hands were artificially contaminated with spores, a 15 second hand wash did significantly ($P<0.001$) [illegible] the quantity of spores released. However, the study did demonstrate [illegible] significantly higher bactericidal effect when a [illegible] brush was used during the disinfection process instead of hand wash, the reason [illegible] being that hand brushing with alcohol [illegible] disinfection of the keratinocyte [illegible] corneum.

The [illegible] for application of a variety of [illegible] based rubs has been studied at length [illegible] that the average time [illegible] approximately between [illegible] (using chlorhexidine or an alcohol based compound)[1, 9]. Kampf et al [12] designed a study to determine whether the duration and volume of application of an alcohol based rub had any impact on the reduction of resident skin bacteria. All test subjects were asked to apply the rub for a period of 3 minutes and the amount of gel used was measured. The results they obtained demonstrated that volume has no impact on [illegible] reduction rates of resident flora, however [illegible] application was the optimum [illegible] to achieve efficacy required with [illegible]. This finding was further [illegible] when a subsequent trial[5, 13] undertaken by the same authors [illegible] that a 90 second hand rub with [illegible] alcohol based agent was as effective [illegible] hand disinfection procedure. The [illegible] large quantity of alcohol [illegible] [illegible] also play [illegible] [illegible] 80% [illegible] concentration [illegible] 0.61% [illegible] has chlorhexidine [illegible] as a co-additive) for surgical [illegible] disinfection[14]. A summary of the

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Conclusion

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References

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11. Hubner N, Kampf G, Loffler H, Kramer A. Effect of a 1 min hand wash on the bactericidal efficacy of consecutive surgical hand disinfection with standard alcohols and on skin hydration. Int J Hyg Environ Health. 2006; 209: p. 285-291.
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Book Reviews

Joint and Soft Tissue Injection: Injecting with Confidence. 4th Edition

Trevor Silver
Radcliffe Publishing, Oxford
ISBN 13 978 1 84619 190 9. 120 pages

The first impressions on receiving this book were good. It is a concise but nevertheless comprehensive guide to injection techniques for common musculoskeletal conditions.

The target audience are clearly general practitioners and hospital based junior doctors for whom this would be an excellent reference. Additionally it would be of use to other colleagues particularly those in physiotherapy who use injections as part of their extended practice.

The chapters are well structured according to region and each covers a review of common pathologies with each subdivided into presentation, functional anatomy and injection technique augmented by clear illustrations and photographs. The final chapter discusses briefly the role of radiological procedures with some nice images to support the text. This is a good overview of the various techniques and when they best may be utilised.

There are a number of inconsistencies in the book, for example the author clearly recommends the use of aseptic technique and in the text and advocates wearing protective gloves whilst giving an injection yet no gloves are worn in the photographic images.

One of the potential difficulties in using this book is that the chapter on general principles and choice of steroid is arguably lacking in some detail. For example the author comments on the increasing strengths of various preparations available, the reader however is no clearer about the relative potency of these preparations. Furthermore, each condition receives great detail regarding

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[illegible] expanded [illegible] complications [illegible] detail especially [illegible] mate. It [illegible] differences [illegible] procedures [illegible] and points to [illegible] visual [illegible] Overall to [illegible] would [illegible] clinic where [illegible] and so [illegible] [illegible] [illegible]

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The New MRCPsych Paper 1 Practice MCQs and EMIs

Oliver White and Clare Oakley
Radcliffe Publishing 2008
pp 134. ISBN 978-184619 254 8

Having completed MRCPsych Paper 1 over 3 years ago I was intrigued to be asked to write a review on this 'new' exam practice book. The Royal College Of Psychiatrists have recently changed the structure of the MRCPsych examination and this book is one of a number that have been published recently to take into account this new examination structure. The primary change has been the adoption of a single best answer from five Multiple Choice Question (MCQ) rather than

Hazardous Waist. Tackling male weight problems

Alan White & Maggie Pettifer (Eds)
2007 Radcliffe Publishing Oxford
ISBN 13 978 184619 103 9 229 pages

Overweight and obesity is increasing. It is a serious health issue that is attracting worldwide public health and media attention. For those of us whose patients have problems in this area understanding this complex problem can be difficult and arguably it can present even more of a challenge understanding the particular issues that affect the male population in this regard. There are often many barriers to engaging with patients regardless of the health [illegible] to effect a change in behaviour [illegible] health [illegible] with those that contribute to and are [illegible] by overweight and obesity and yet an [illegible] of where those barriers might lie [illegible] important step in establishing a [illegible] factors [illegible] a result of a conference in 2005 [illegible] by the Men's Health Forum this text [illegible] 21 chapters. The earlier pages [illegible] the issues of [illegible] obesity as they affect male [illegible] perspectives and explain [illegible] male psyche and [illegible] between the [illegible] regard and right [illegible]

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Dr Dan Ro z de Sa

Men's Health – How to do it

Edited by David Conrad and Alan White Published 2007 £21 95 Radcliffe Publishing ISBN 978 1 84619 192 3

Hav ng served on the committee for the f rst Nat onal Mens Health Week n 2002 I was keen to read th s book It s based on the work of the Bradford Health of Men Services from 1999 and descr bes how a comm tted team ha researched developed and sustained targeted mens health promot on

Service News

Honours, Awards and Citations

Queen's Honorary Physician

Surgeon Captain D C Brown QHP OStJ FFOM Royal Navy

Queen's Honorary Nursing Sister

Captain H L Allkins QHNS BSc RGN QARNNS

Academic Achievements

Surgeon Commander J Denholm Royal Navy MRCGP with Merit

Surgeon Commander P J Haworth Royal Navy MSc

Surgeon Commander K J Haworth Royal Navy DAvMed

Surgeon Commander S McCaba Royal Navy Passed ASCAB Board

Surgeon Commander S Phillips Royal Navy Passed ASCAB Board

Surgeon Lieutenant Commander D Baard Royal Navy FRCA

Surgeon Lieutenant Commander C Raston Royal Navy
[illegible] & Orth)

Surgeon Lieutenant Commander K King Royal Navy
LRCP

Surgeon Lieutenant Commander L Morris Royal Navy
DRCOG

Surgeon Lieutenant Commander C R McLean Royal Navy
Intercollegiate Specialty Examination in Trauma and Orthopaedic Surgery - Section 2

Surgeon Lieutenant S Gorham Royal Navy DRCOG

Surgeon Lieutenant L Cochran Royal Navy DRCOG

Surgeon Lieutenant Commander J Lawson Royal Navy FRCR

Surgeon Lieutenant Commander P S C Rae Royal Navy
BASICS Doctor of the Year

Surgeon Lieutenant D McMeekan Royal Navy MRCS

WO D Loughlan
MA in Business Management with Merit

PROMOTION

Surgeon Sub Lieutenant to Acting Surgeon Lieutenant

Surgeon Sub Lieutenant G K Boyes Royal Navy
Surgeon Sub Lieutenant A Lunde Royal Navy
Surgeon Sub Lieutenant S McIntosh Royal Navy
Surgeon Sub Lieutenant D J O Brien Royal Navy
Surgeon Sub Lieutenant J R Saffin Royal Navy
Surgeon Sub Lieutenant W M J Sharp Royal Navy
Surgeon Sub Lieutenant E J Shaw Royal Navy
Surgeon Sub Lieutenant M A Simpson Royal Navy
Surgeon Sub Lieutenant W J C E Tanzer Royal Navy
Surgeon Sub Lieutenant M H W Thompson Royal Navy
Surgeon Sub Lieutenant V Y Ahuja Royal Navy
Surgeon Sub Lieutenant M A Osborne Royal Navy
Surgeon Sub Lieutenant J S Glanvill Royal Navy
Surgeon Sub Lieutenant M Simpson Royal Navy

Acting Surgeon Lieutenant to Surgeon Lieutenant

Acting Surgeon Lieutenant S Jamieson Royal Navy
Acting Surgeon Lieutenant A H Henderson Royal Navy
Acting Surgeon Lieutenant S M T Jeffery Royal Navy
Acting Surgeon Lieutenant P J [illegible] Royal Navy
Acting Surgeon Lieutenant A F H Shaw Royal Navy
Acting Surgeon Lieutenant W J Derby Royal Navy
Acting Surgeon Lieutenant I A M M [illegible] Royal Navy
Acting Surgeon Lieutenant R L F [illegible] Royal Navy
Acting Surgeon Lieutenant A L Hal[illegible] Royal Navy
Acting Surgeon Lieutenant J A M [illegible] Royal Navy
Acting Surgeon Lieutenant [illegible] Royal Navy
Acting Surgeon Lieutenant [illegible] Royal Navy
Acting Surgeon Lieutenant M W [illegible] Royal Navy
Acting Surgeon Lieutenant S D P To[illegible] Royal Navy

Surgeon Lieutenant to Surgeon Lieutenant Commander

Surgeon Lieutenant K King Royal Navy
Surgeon Lieutenant S Middleton Royal Navy
Surgeon Lieutenant D Henning Royal Navy
Surgeon Lieutenant J Penn Barwell Royal Navy
Surgeon Lieutenant G Macfarlane Royal Navy
Surgeon Lieutenant A Cavin Royal Navy
Surgeon Lieutenant V Sanders Royal Navy
Surgeon Lieutenant D Gardner Royal Navy
Surgeon Lieutenant K G Imbert n Royal Navy
Surgeon Lieutenant D Gordon Royal Navy
Surgeon Lieutenant E Hill[illegible] Royal Navy
Surgeon Lieutenant S [illegible] Royal Navy
Surgeon Lieutenant [illegible] Royal Navy
Surgeon Lieutenant R S[illegible] Royal Navy
Surgeon Lieutenant M L[illegible] Royal Navy
Surgeon Lieutenant [illegible] Royal Navy
Surgeon Lieutenant D S[illegible] Royal Navy
Surgeon Lieutenant L Mo[illegible] Royal Navy

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Surgeon Lieutenant [illegible]

Surgeon Lieutenant Commander to Surgeon Commander

Surgeon Lieutenant Commander [illegible] Royal Navy
Surgeon Lieutenant Commander [illegible] Royal Navy
Surgeon Lieutenant Commander [illegible] Royal Navy
Surgeon Lieutenant Commander [illegible] Royal Navy

Acting Surgeon Commander to Surgeon Commander

Acting Surgeon Commander B R [illegible] Royal Navy

Surgeon Commander to Surgeon Captain

Surgeon Commander R Ross MBE Royal Navy
Surgeon Commander P A Hughes Royal Navy
Surgeon Commander K J Aitchison Royal Navy

MEDICAL SERVICES

Sub Lieutenant to Lieutenant

Sub Lieutenant P W Tagg Royal Navy

Lieutenant Commander to Commander

Lieutenant Commander D W Finn Royal Navy
Lieutenant Commander J C Thain Smith Royal Navy

QARNNS

Sub Lieutenant to Lieutenant

Sub Lieutenant L M Cantillon

Commander to Captain

Commander H L Atkins

PLACED ON RETIRED OR EMERGENCY LISTS

Surgeon Commodore J J W Sykes Royal Navy
Captain L Gibbon QARNNS
Captain M Bowen Royal Navy

POMA Emma Boswell successfully captained the RN Ladies Cricket Team to victories over both the RAF and Army to secure the 2008 Trophy. POMA Boswell was also awarded the Player of the Match Bottle of Champagne for the match against the Army

[illegible] urnal. It has been agreed that we will [illegible]

Journal of the Royal Army Medical Corps
Armed Forces Mental Health Special Issue

Obituary

Surgeon Captain Fergus Alastair Ferguson Mackenzie QHP MB ChB DMRD FRCR RN

22 July 1922 – 20 February 2008

Fergus often [illegible] senior colleagues [illegible] charm and [illegible] disguised a [illegible] hold his own [illegible] afraid to [illegible] his piece without [illegible] music and played [illegible] appointment [illegible] a member of the [illegible] Scottish country [illegible] who enjoyed play[illegible] golf. The latter [illegible] in Malta he was [illegible] Golf Club.

Fergus was [illegible] Musselburgh and [illegible]

University [illegible] 1945 [illegible] Western [illegible] 1946 [illegible] Volunteer Reserve [illegible] undergraduate [illegible] the Clyde River [illegible] Medal. He [illegible] general duties to [illegible] training establishment [illegible] at RNH [illegible] Permanent List [illegible] 1947 and [illegible] afterwards was appointed [illegible] 1950 [illegible] AEF [illegible] [illegible]

[illegible] 1959 [illegible] 1967 [illegible] she [illegible] him on [illegible] appo[illegible] [illegible]ing his [illegible]

[illegible] where he held a [illegible] at Musgrave Park Hospital. On [illegible] in 1988 they returned to [illegible] had the time to practice his [illegible]. He was a keen gardener [illegible] and being trusted by [illegible] Society with rare seeds. He [illegible] He [illegible] and was appreciated [illegible] History Society [illegible] or the piano [illegible]

[illegible] colleague [illegible] who knew him.

[illegible]

Miss Ruth Stone Matron OARNNS RRC Sister of the Order of St John

7 July 1923 – 31 July 2007

It was with much sadness that I learned of the death of Ruth Stone who died on 31 July 2007. She was for many years a family friend as well as a popular, much loved and above all a highly professional nursing officer.

Ruth was born on 7 July 1923 in Bristol. She was educated at Colston Girls School and [illegible] as a nurse at Bristol Royal Infirmary. She joined the OARNNS at RNH Plymouth in 1947 and was appointed to HMHS MAINE and [illegible] in Korea in 1949 where she spent two years. This conflict made a deep impression on [illegible] and indeed she described how hard it was at the time for all the medical staff who [illegible] as well as providing care aboard the ship during [illegible] fighting were sent ashore to assist [illegible] the field hospitals. Afterwards [illegible] contributed a chapter to the book 'British [illegible] the Korean War'.

[illegible] 1951 she was promoted Senior Nursing [illegible] and shortly afterwards appointed to RNH Chatham and in 1954 to SQ RNAS HALFAR in Malta. It was during this time that my family [illegible] and she became a long term friend. Despite her duties in the sickbay she [illegible] a small boy and provided him on request with 'keep ing young pills' [illegible] These turned out to be Vitamin C. She had a great sense of humour and fun which is [illegible] by those who knew her and which [illegible] she never lost.

Her [illegible] career for nearly thirty years to [illegible] all the existing Naval Hospitals with the exception of Mauritius. She was one of the youngest nursing officers to be awarded the Associate of the Royal Red Cross in 19[illegible]. In 1975 she became a Sister of the Order of St John of Jerusalem and the following year 1976 was awarded the Royal Red Cross.

Her experience of nursing in difficult conditions not only [illegible] her in good stead as

a practising nursing S[illegible] equip her for the ro[illegible] commonsense a[illegible] make diff cult dec[illegible] loyalty and affect[illegible]

Ruth was pror[illegible] S ster in 1959 and [illegible] served w th the [illegible] occasions the as[illegible] follow ng wh ch she was [illegible] Matron at RNH Ma[illegible] very soc able person[illegible] and n Malta wo ld [illegible] house outs de the [illegible] or a for a gam e of [illegible] excelled On one [illegible] to one of her n rs [illegible] hold a lunch party

[illegible]

Notice has been rece ved of the death [illegible] the follow ng

Surgeon Captain James A M Wright Royal Navy (Ret d)

Mrs Edith Curson QARNN (Ret d)

The ed tor would welcome any words n memory of h m

J Royal Naval Medical Service 2008 94 3 134-135

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[illegible]
Surgeon Captain (D) M W [illegible]
Captain P [illegible] Captain [illegible]
[illegible] R Hughes
[illegible]
Lieutenant [illegible]

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The title page should contain a concise informative title, up to five key words, the names and initials of all authors, and their appointments and the department(s)/institution(s)/hospital(s)/establishment(s) where the work was carried out.

Tables and illustrations

Tables and illustrations (figures) should add to the paper rather than only repeating information presented in the text. Each table and illustration should be on an individual page, separate from the text, be numbered in two distinct sequences in the order in which they are mentioned in the text, and have an explanatory caption (typed on a separate sheet for illustrations).

News photographs of academic, social, sport or other occasions involving members of the Royal Naval Medical Service are welcomed.

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